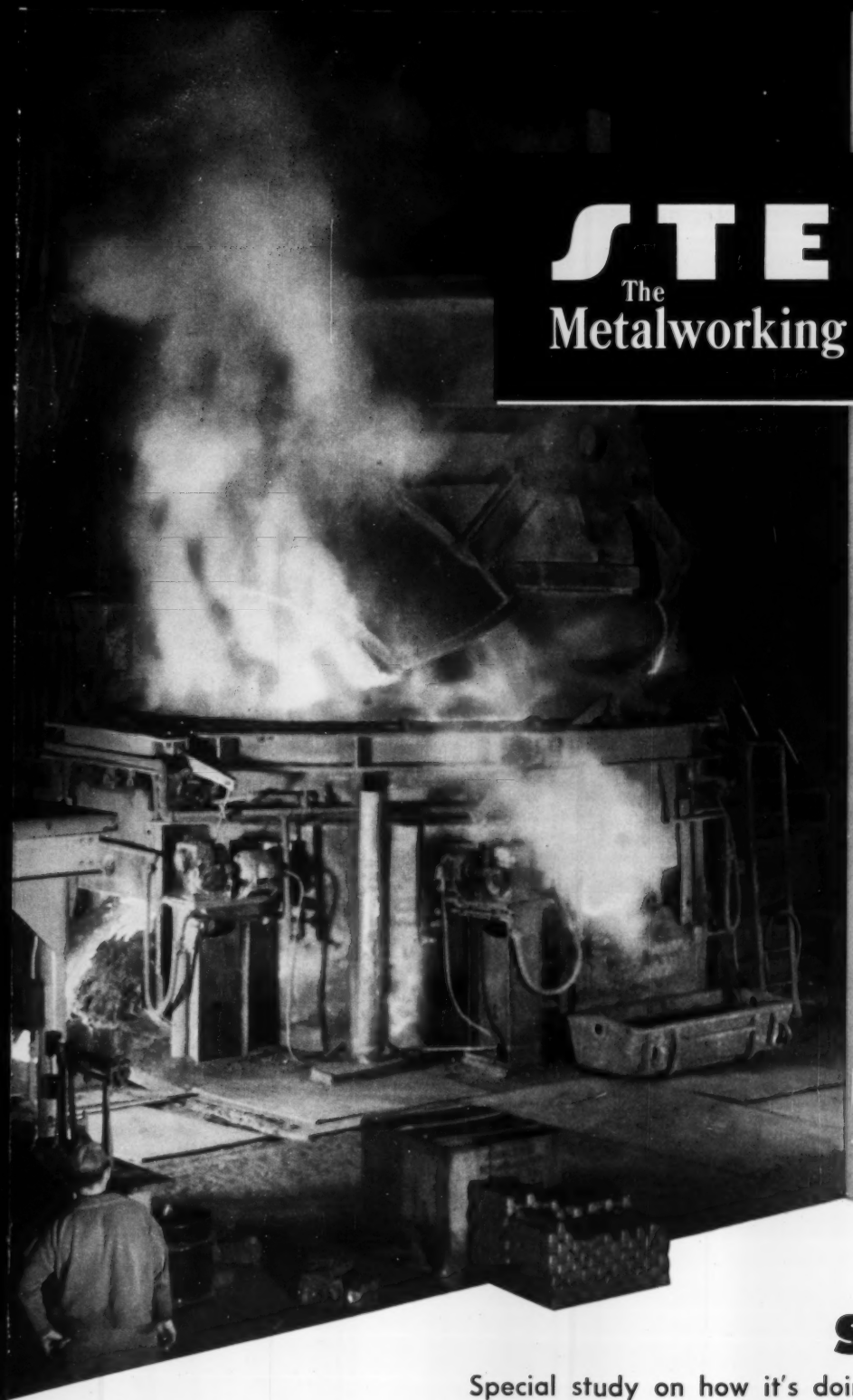
NOVEMBER 4, 1957

STEEL
The Metalworking Weekly

A PENTON PUBLICATION



Stainless

Special study on how it's doing and where it's going point up new paths to profits...Page 107

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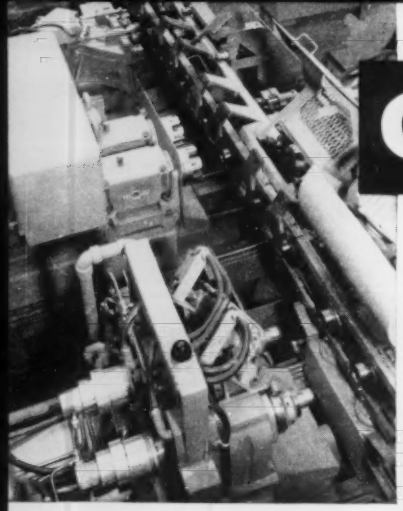

Q Where does Heald automation BEGIN

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A *Wherever you want— from rough casting to finished part!*

THE EXTENT to which you apply automation in your plant is largely a matter of production economics. But whether your automated lineup consists of two stations or twenty, Heald can do the whole job from start to finish.

Perhaps, like some other men in metalworking management, you look upon Heald Bore-Matics as strictly high-precision machines that couldn't (or shouldn't) be used for *roughing* operations. Actually, Heald Bore-Matics can be and have been designed most successfully, to provide whatever degree of precision you need—from drilling, reaming, tapping, slotting, rough boring, turning and facing, etc., to any combination of precision-finishing operations.

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Sta. 4. Face 2 spots on flange.

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Courtesy: Eco Engineering Co.

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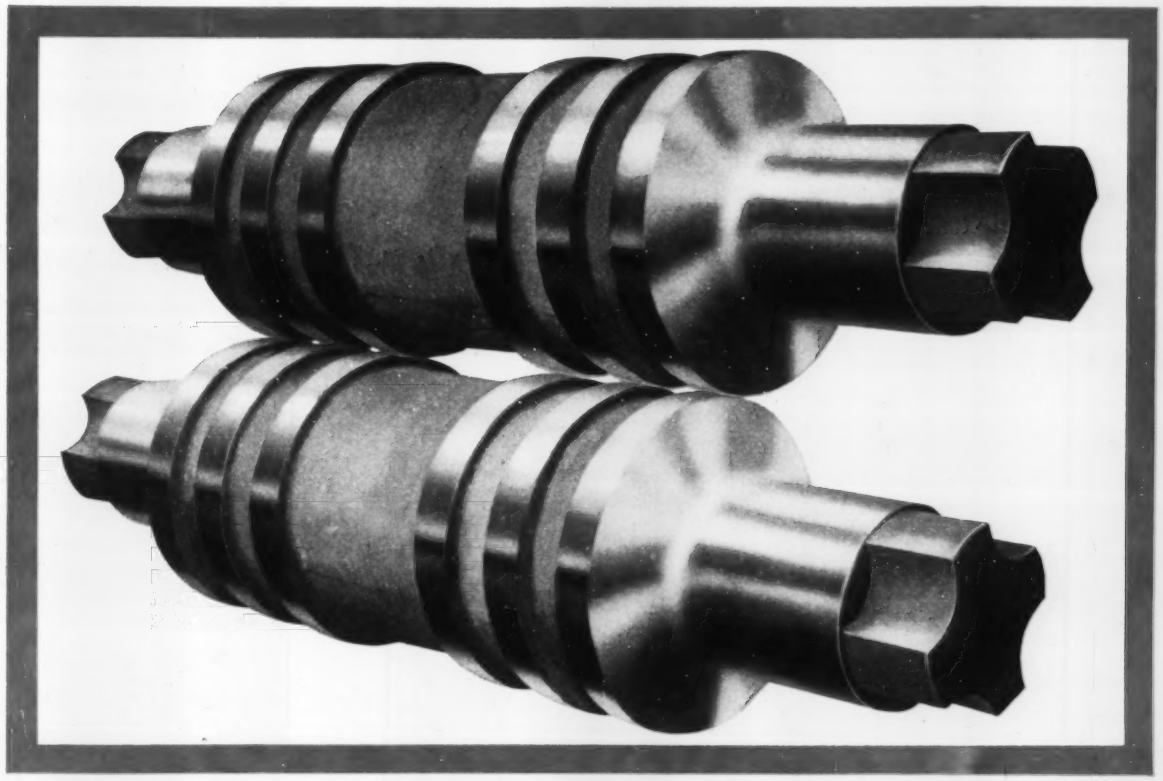

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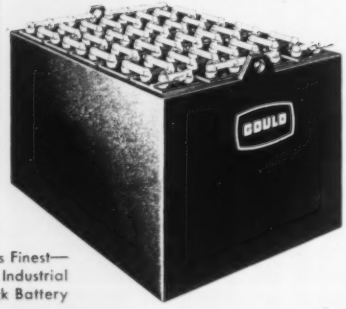

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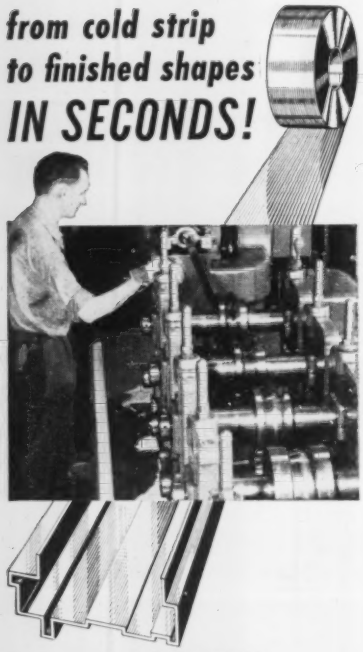
from cold strip to finished shapes
IN SECONDS!



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A new, revised, Fifth Edition of the Yoder Cold-Roll Forming book is just off the press. In addition to economic and mechanical possibilities of cold-roll forming, it contains numerous illustrations of end uses and applications of roll-formed shapes. Write for your copy today.

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behind the scenes

Birth of a Feature

The story you are about to read is true; only the names have remained unchanged to protect the innocent.

It was 8:33 a.m., Friday, Aug. 9. Al Gray, technical editor, was working out of the Technical Section. His partner, Associate Editor Austin Brant, unaware of the partnership, was wondering where he could pick up a cheap used guitar. Their boss, Editor Walt Campbell, was two doors down the hall, chewing a 6-ounce cigar. Gray decided to write a letter to Campbell. This was a particularly shrewd move because no investment in postage was required.

"Dear Walt," he wrote. True, he could have shouted this greeting over the transom, but our editors don't operate that way. They are trained to communicate by typewriter. "Here is a Prospectus for a Special Report on Stainless Steel. This 16-page article is planned as a joint project of the entire editorial staff and the market research department and will bring users and producers up to date on the potential of the material."

10:30 a.m.: Campbell received the letter by interoffice mail. Pat Kearney, the young gentleman who delivered it, set the envelope down tenderly—not because he was impressed but because the stump of his index finger, lost in the armed services, was extra sensitive that morning.

8:33 a.m., six days later: Campbell answered the letter. He expressed the hope that the stainless study would prove to be the first of a whole family of penetrating reports on basic materials. He closed with best regards, and in the course of that same afternoon Kearney delivered the reply to Gray. "Wonder what they'd say in Scranton," young Mr. Kearney muttered, "if they knew I carried letters back and forth between two guys who can see each other from their own offices?"

The Stainless Story

The special report fell into four major areas: Trends in production and distribution; trends in user thinking; trends in application; trends in design and fabrication. When the copy came flowing in from STEEL's editors here and everywhere, Brant and Copy Editor Harry Chandler endeavored to whittle it down to 16 pages. For a time, as varied reports came tumbling in, Chandler thought he was in the middle of a Chinese fire drill.

Meanwhile, back at the ranch—or rather, the Art Dept.—Art Director Bill Kellogg was planning STEEL's cover from a transparency generously supplied by Murrin Held, Public Relations Dept., Allegheny Ludlum Steel Corp.

The illustration, printed in three colors, shows a mess of stainless steel being cooked up in an electric arc furnace, only you can't see it, and it really isn't being cooked. While stainless steel is an important metal today, it hasn't been established too long. Everybody except the Russians seemed to have had a hand in inventing it. In 1865, a Mr. Bauer in Brooklyn sought a patent for a chromium steel alloy he devised. He sold his product, strangely enough, in the form of stainless steel safes and jail bars, but we have no record of the reaction of safe-crackers and jail-breakers to these unsporting restraints.

Englishmen, Germans, and Americans worked on such things as gun barrels, cutlery, pyrometer tubes, and the effects of chromium on oxidation resistance in the years before World War I. Out of their experiments have come the stainless steels of today. The tremendous and comprehensive report on this remarkable metal begins on Page 107 and continues for 16 pages.

How Not To Get Ahead

Three efficient headhunters raided a village and obtained a splendid haul because it was the siesta hour and nobody woke in time. After stacking the loot in an imposing pile, they agreed to let each man take as many heads as he had wives. Mbingo took three more heads than Mbango, while Mbongo took twice as many as Mbingo, which gave him 11 more than Mbango. How many heads were in the pile?

Shrdlu

(Metalworking Outlook—Page 59)

B.F.Goodrich report:

Too hot to handle but it travels on rubber

B.F.Goodrich improvements in rubber brought extra savings

Problem: That fog you see is a cloud of smoke and steam rising from sizzling hot sand on conveyor belt in a foundry. The sand is a scorching 300 degrees—so hot it was ruining belts in a few months.

What was done: When a B.F.Goodrich distributor heard of the problem, he recommended a new conveyor belt called Solarflex. This belt, designed by B.F.Goodrich engineers, is made of a special rubber that stays soft and pliable at temperatures that cause other belts to harden, crack and finally break down.

Savings: The B.F.Goodrich hot-material belt you see here had lasted 30 per cent longer than the previous belt when the picture was taken. It had performed for 9 months—old age for a belt working 16 hours a day, 5 days a week, hauling 60 tons of hot sand an hour.

Extra benefits: Because the B.F.Goodrich Solarflex belt stays flexible even when exposed to high heat, it not only lasts longer than other hot-material belts, but also reduces maintenance costs because it holds fasteners better.

Where to buy: Your B.F.Goodrich distributor has full information on the conveyor belt described here. And, as a factory-trained specialist in rubber products, he *can* answer your questions about *all* the rubber products B.F.Goodrich makes for industry. *B.F.Goodrich Industrial Products Company, Dept. M-181, Akron 18, Ohio.*

B.F.Goodrich

INDUSTRIAL PRODUCTS

"THE CRUX OF THE HONEYCOMB SANDWICH WILL ALWAYS BE THE BOND"

*B-58 bomber designed and built by the Convair Division of General Dynamics Corporation, Fort Worth, Texas.

B-58 engine nacelle section. Stainless steel honeycomb structure whose light weight is evident. Its strength and aerodynamic qualities are attested to in flight in the world's fastest jet bomber.

This is a direct quote from a recent article on honeycomb structures in *Aeronautical Purchasing* magazine. It states exactly what authorities in the field of supersonic speeds already know, and clearly points up the aims and activities of Handy & Harman in this critical and challenging field.

One of the most significant applications of the honeycomb sandwich can be found in the United States Air Force new supersonic bomber, the B-58.* Elements of this "missile with a man in it" are made of high-strength stainless steel honeycomb sandwich, *bonded* with Handy & Harman special silver brazing alloys – a method which permits honeycomb assemblies of virtually any size.

The honeycomb principle needs no further testimonial. Indeed, the problems it solves and the obstacles it overcomes *now* can mean only that its future is immensely promising. Work with all kinds of materials; metals, ceramics, plastics, paper, etc., is now in progress to further increase its present great values.

Handy & Harman, with its knowledge and facilities in the field of joining metals, can be of great help to you in many of these honeycomb sandwich research areas. Many of the developments in silver alloy brazing, heating methods, production techniques and the formulation of special alloys for special needs, were originated by Handy & Harman. Your efforts in devising new methods in metal joining and in meeting present bonding needs can be helped, in large measure, when you call on Handy & Harman.

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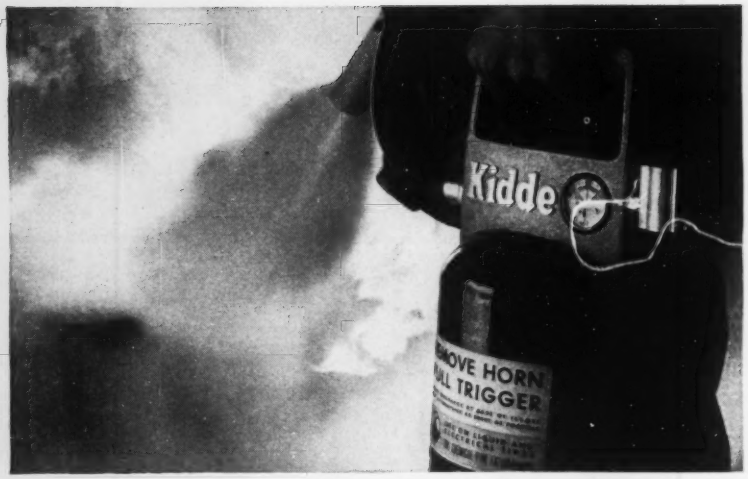

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LETTERS TO THE EDITORS

Useful for Rapid Comparison

We would appreciate two copies of STEEL's Brazing Alloy Selector (Oct. 7, Page 162). This excellent compilation is most useful for rapid comparison in the wide range of brazing filler metals covered.

Should the need arise, would it be possible to obtain reprints in larger numbers, perhaps a hundred?

F. C. Brosnan
Engineering Div.
Handy & Harman
New York

• *Yes. Write to Miss June Schilens, Reprint Dept., STEEL, Penton Bldg., Cleveland 13, Ohio, for information.*

I would appreciate a reprint of the Brazing Alloy Selector. The tables will be an invaluable aid in our procurement work.

R. A. Weckstein
Manager-Purchasing
G-V Controls Inc.
East Orange, N. J.

Make-or-Buy Problem

Kindly furnish three copies of the extremely informative article, "Make or Buy?" (Oct. 14, Page 105). I would like to place copies in the hands of others in our organization.

John S. Wheeland
Purchasing Agent
Anchor Coupling Co. Inc.
Libertyville, Ill.

I have read your ninth Program for Management article ("Make or Buy?") and would appreciate receiving copies of other articles in the series. I am particularly interested in the article on research.

The series makes an excellent contribution.

John Motto
Product Development Engineer
Bohn Aluminum & Brass Corp.
Detroit

Your 1957 Program for Management has proved interesting and helpful. I'd appreciate copies of the nine articles published so far.

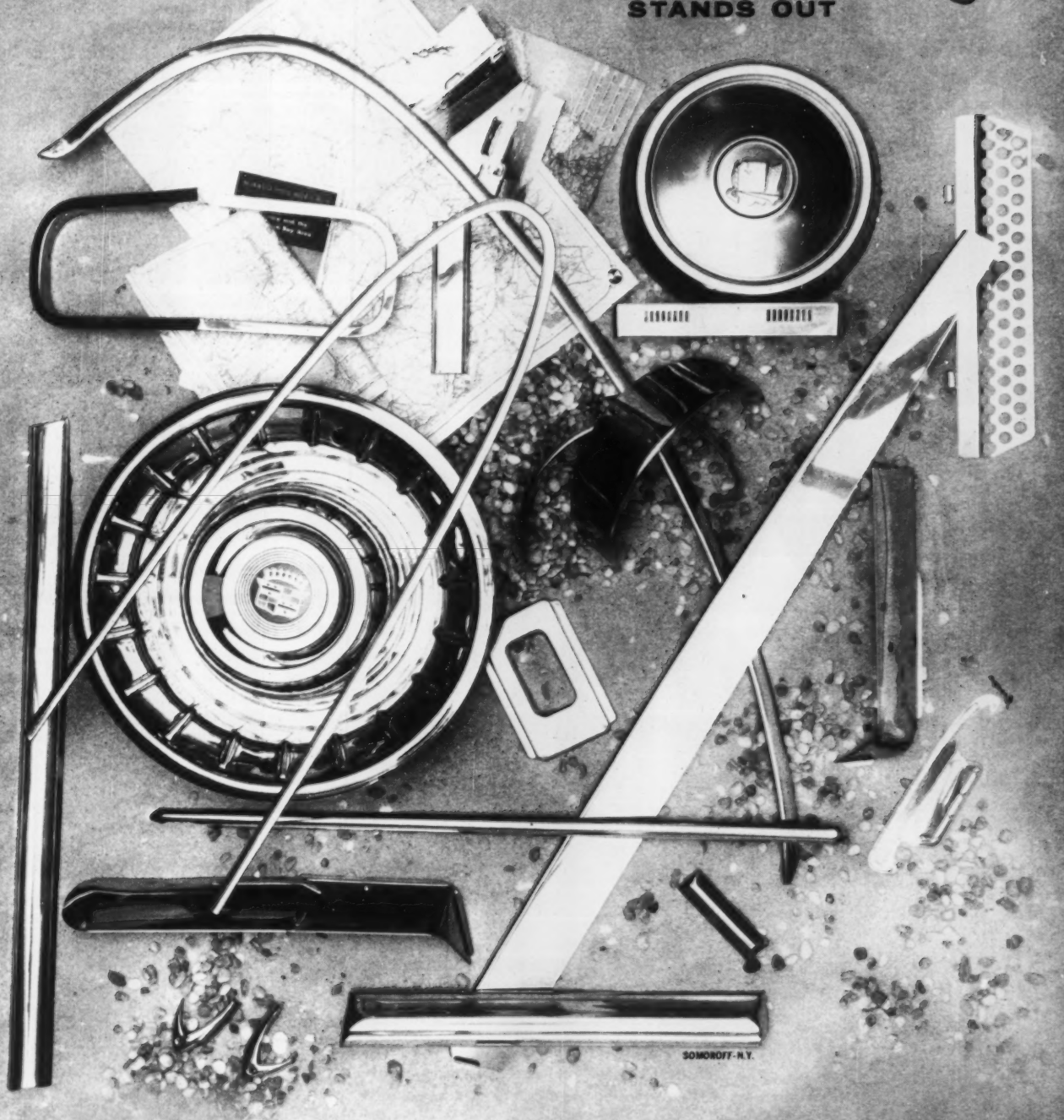
R. P. Scott
Vice President
General Blower Co.
Morton Grove, Ill.

Better Bosses Wanted

Would you be kind enough to send me a copy of the article, "How To Be

(Please turn to Page 12)

IN AUTOMOTIVE TRIM, TOO, **Sharonsteel Quality** STANDS OUT



Only Stainless Steel has really *lasting* beauty that defies flying stones, road chemicals, salt air, rust and corrosion season after season. Discerning automotive designers used more Sharon Stainless Steel this year than ever before for exterior and interior trim and accessories.

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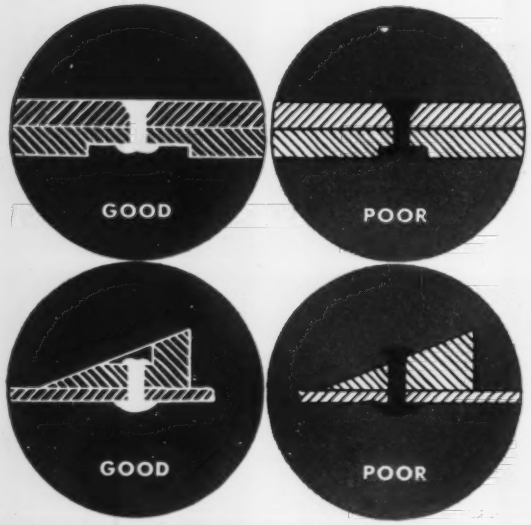
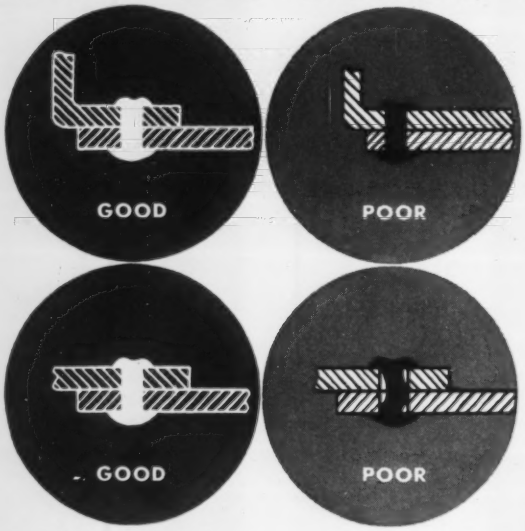


TIPS ON USING RIVETS



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LETTERS

(Concluded from Page 10)

a Better Boss" (Sept. 23, Page 90)? I found it to be most helpful and interesting.

May we have permission to reproduce the article within our own plant?

John P. O'Connor
Industrial Relations Dept.
Shipbuilding Div.
Bethlehem Steel Co
Quincy, Mass

• *Permission granted.*

Please send ten copies each of the articles, "How To Be a Better Boss" and "How To Get More from Machine Tools" (Sept. 23 insert).

This issue is an outstanding one; we congratulate you.

Carl W. Shattuck
Vice President
McKiernan-Terry Corp
Dover, N. Y

Price Rise of Interest

I found your article, "Why Prices Rise" (Sept. 30, Page 45), particularly interesting. We would appreciate several copies.

E. H. Burk
Vice President-Mfg.
Sterling Radiator Co. Inc
Westfield, Mass

Missile Story Helpful

Please send a copy of the article, "Missiles in Quantity Soon?" (Oct. 7, Page 119). We found it helpful.

E. C. Wasson
Sales Manager
Missiles Project Dept.
Butler Mfg. Co.
Kansas City, Mo.

We read with considerable interest your article, "Missiles in Quantity Soon?" and would appreciate a copy.

Howard W. Bootz
Secretary-Treasurer
Wm. R. Bootz Mfg. Co. Inc.
Evansville, Ind.

May I have extra copies of your excellent presentation, "Missiles in Quantity Soon?"

Richard B. Foster
Director of Procurement
Aeronautical Div.
Minneapolis-Honeywell Regulator Co.
Minneapolis

Management Article Pleases

Enjoyed your article, "Management's First Line" (Oct. 14, Page 76). I would like two copies.

J. D. Goodall
Assistant to the President
Northwestern Steel & Wire Co.
Sterling, Ill.

Please send eight reprints of the article, "Management's First Line." I found it interesting and know it will be of interest to our department supervisors.

R. L. Kelley
Plant Manager
Damascus Tube Co.
Greenville, Pa.

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Artist's drawing of an intercontinental strategicmissile, courtesy Rocketdyne Division, North American Aviation, Inc.,

STAINLESS STEEL PRODUCTS DIVISION

J. BISHOP & CO. Platinum Works

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"Metals for Precision and Performance"

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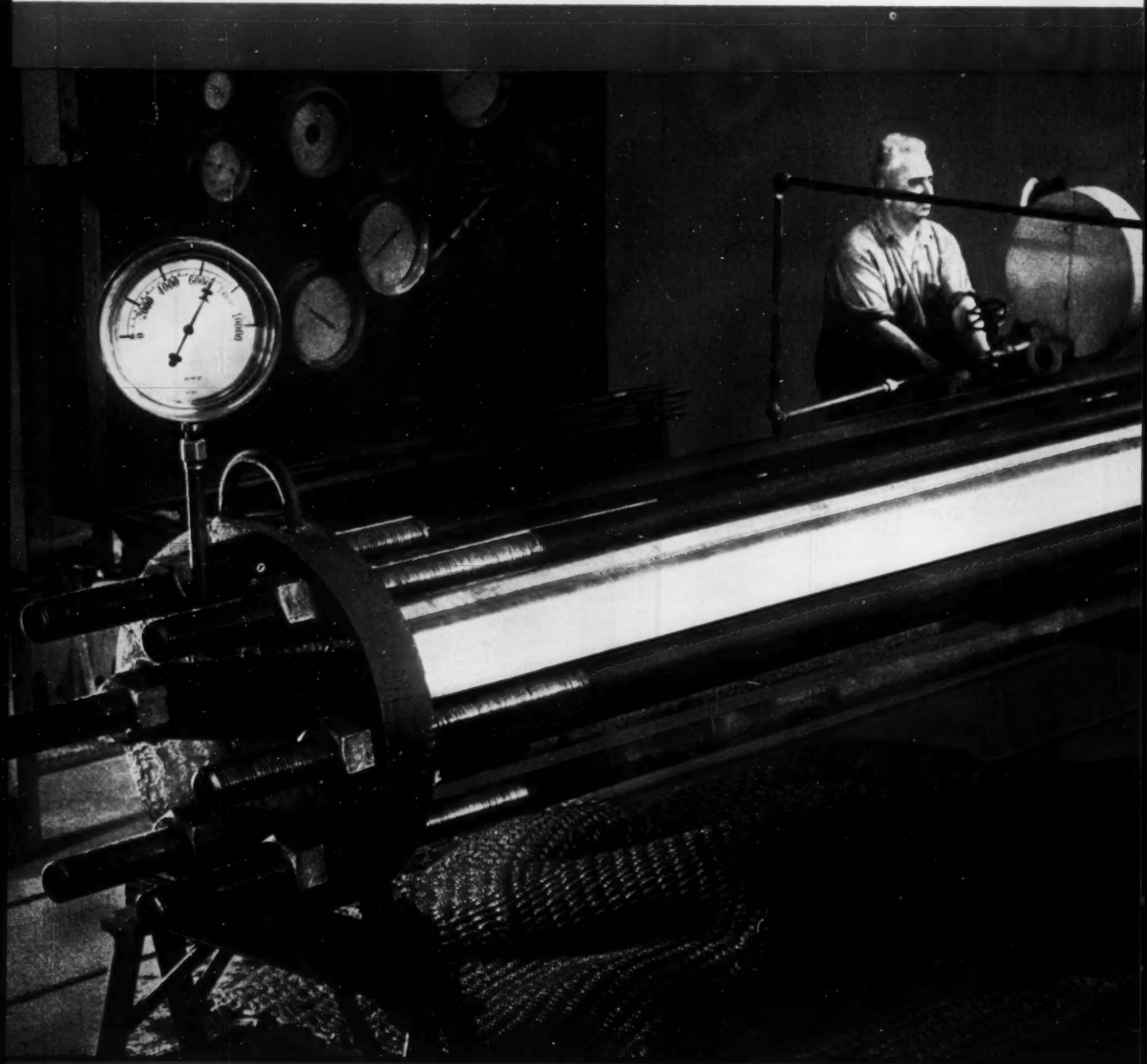

ABOVE: Hydrostatic test rig used to qualify each length of pipe.

UNITED STATES PIPE & FOUNDRY CO.

Steel and Tubes Division

STEEL & TUBES — U.S. PIPE — DIVISION

BURLINGTON, NEW JERSEY

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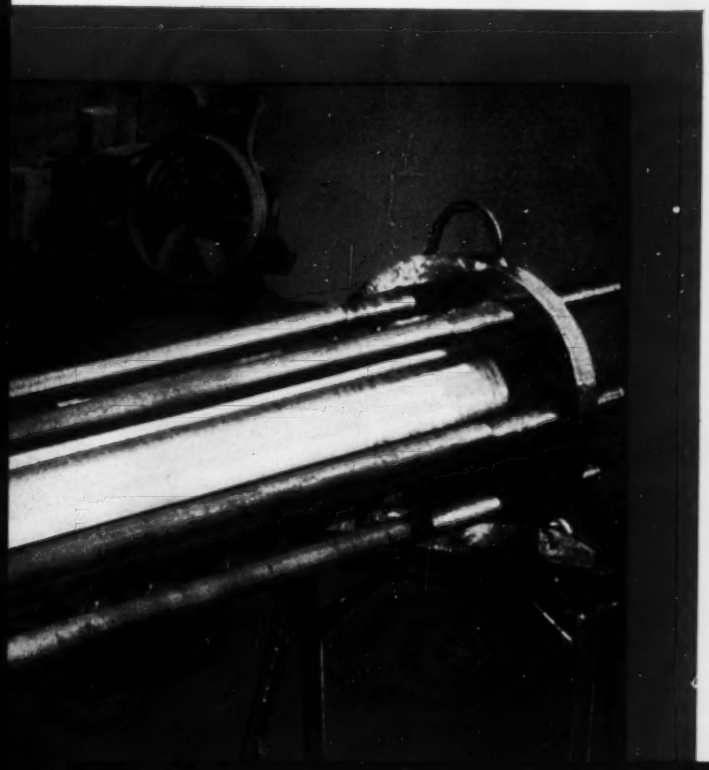
THE ANSWER TO YOUR PIPING PROBLEM



Patented U. S. Pipe process meets rigid refinery specifications

The men who design today's petrochemical plants, refineries or Atomic power plants are confronted with piping problems involving temperatures, pressures and corrosive conditions which only a few years ago would have been called impractical, if not impossible.

U. S. Pipe's Steel & Tubes Division recently completed a piping requirement for 700 feet of Type 316 Extra Low Carbon, columbium-bearing stainless for a large petrochemical plant, which is typical of the job metal mold centrifugally cast pipe is doing today under a patented manufacturing process with rigid Quality Control.

U. S. Pipe is headquarters for metal mold centrifugally cast alloy and stainless steel pressure pipe over a wide range of special and standard analyses —in large or small quantities.

Write and outline your piping problems. We may be able to help.

Note these exacting specifications on 316 Cb ELC Stainless Steel Pipe demanded by one of nation's leading oil companies:

MATERIAL REQUIREMENTS: Pipe shall conform to ASTM Specification A-362-52T.

CHEMICAL ANALYSIS: Modified AISI Type 316 Cb (ELC), with *one percent* spread on chrome and nickel.

FINISH: Each pipe to be turned, bored and faced to surface finish of 125 micro inch or better. O.D. tolerance plus 1/16″ minus 0″; I.D. tolerance plus 0″ minus 1/32″. Pipe size: 12″ O.D. × 1.17″ wall.

MECHANICAL TESTS: Tensile Tests — 2 tests required on each pipe after heat treatment; one at room temperature, one at 700° F.

INSPECTION REQUIREMENTS

1. Etching test on sections cut from each end of pipe.
2. Radiographic Inspection — Required complete circumferential coverage of at least an 8″ wide section at each end of each pipe in accordance with ASTM Specification E71-52.
3. Fluid Penetrant—Entire O.D. and I.D. surface each piece.

HEAT TREATMENT: Heat for 4 hours at 2100° F.—2150° F., water quench, follow by 5 hours at 1500° F.—1600° F. Cool in still air.

HYDROSTATIC TEST: Each length tested to stress of either 90% of the minimum cold yield strength or a maximum pressure of 6800 psi —whichever is lower.

SIZE RANGE AND COMPOSITION FLEXIBILITY

Outside Diameter—6″ to 50″
Wall Thickness—⅜″ and up
Length—Up to 16′
Types of Stainless—All Standard AISI and ACI grades of ferritic and austenitic stainless, including No. 20 Alloy, 17-4 P H, 17-7 P H and E.L.C. grades.

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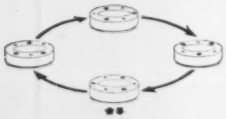
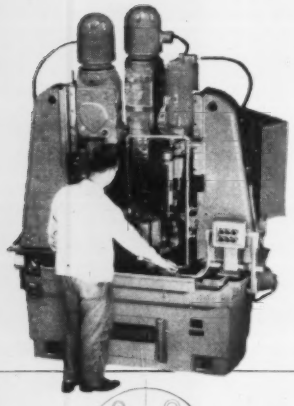
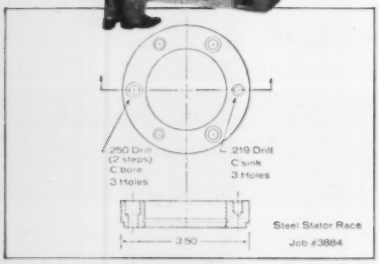
EVERY 12½ SECONDS







This Kingsbury indexing automatic performs these three operations on 290 steel stator races per hour (gross). Three vertical operating units have multi-spindle auxiliary heads. All tools have guide bushings to maintain accuracy. An air cylinder actuates the clamp.

Simple (like this) or complex, a Kingsbury is the best indexing automatic you can buy:

it will be fully tooled, ready to produce

it will meet your specifications for accuracy and production rate

it will pay for itself in a matter of months

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It takes a combination of skillful, reliable men, and the finest equipment to produce the superior quality, strength and soundness required by these large, fast-rotating forgings. The Erie Forge & Steel Corporation's Research and Development program has the responsibility from selection of raw materials, through melting, forging, heat treating, machining and testing to make quality ingots and forgings that easily meet the greater technical perfection imposed by the Electrical Industry.

This 90" diameter ingot, of high alloy steel, weighs approximately 230,000 pounds. It will be forged on this giant forging press to produce a finished machined turbine rotor shaft, weighing approximately 70,000 pounds.

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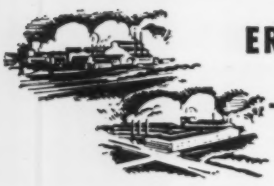

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Phone your local Bellows Field Engineer, ask him to sit down with your production men. No cost. No obligation. Automate step by step.

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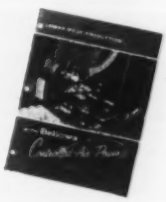

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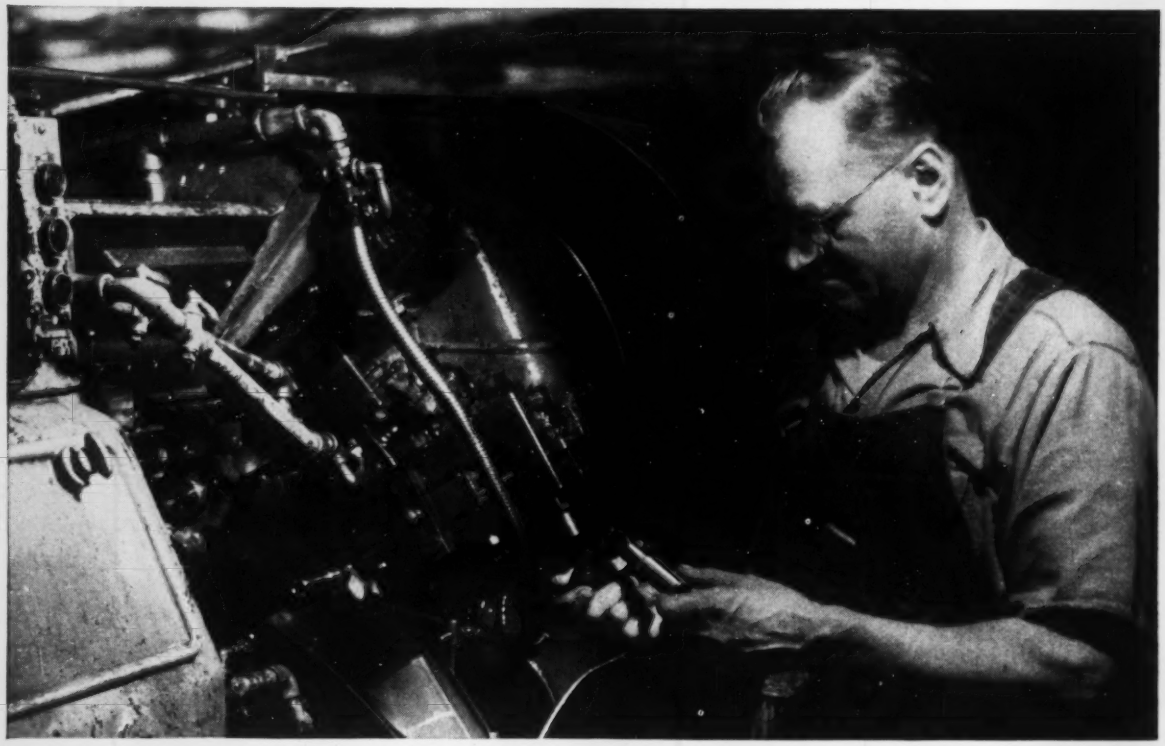

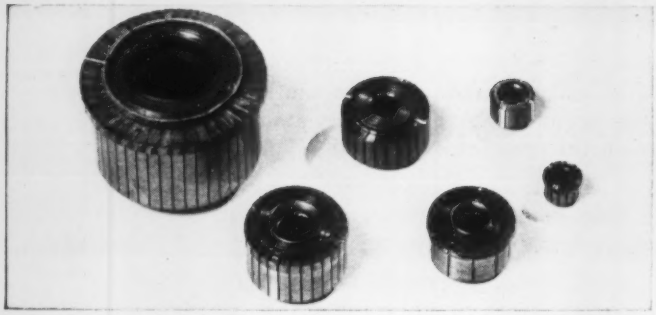

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The answers to these and many other questions are contained in Republic's *free book,* "How To Machine ENDURO Stainless Steel Bars".

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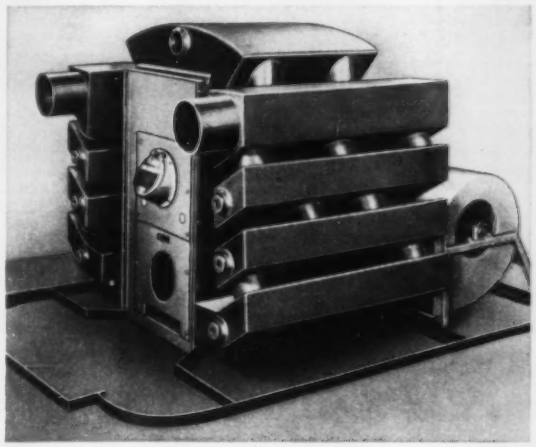
Our metallurgists and machining specialists will give you expert, obligation-free assistance on application, processing and use. Just send the coupon if you would like one to call, or for your copy of, "How To Machine ENDURO Stainless Steel Bars".



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Moving at high speed—24 hours a day if required—belt conveyors handle huge tonnages in a continuous stream. Loading and unloading delays are eliminated, and there's no time lost on empty return runs. Operating costs are relatively low, based on cost per ton handled. In fact, economies of belt conveyor operation and upkeep generally top any other form of bulk material transportation. And thanks to their extreme flexibility, installation is easy even in difficult locations.

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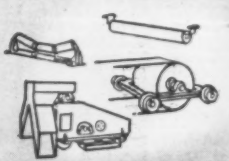

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OF MEETINGS

Nov. 2-8, American Society for Metals: Annual meeting, Palmer House, Chicago. Society's address: 7301 Euclid Ave., Cleveland 3, Ohio. Managing director: William H. Eisenman.

Nov. 2-8, National Metal Exposition and Congress and World Metallurgical Congress: International Amphitheatre, Chicago. Information: American Society for Metals, 7301 Euclid Ave., Cleveland 3, Ohio. Managing director: William H. Eisenman.

Nov. 3-8, Society for Nondestructive Testing: Annual meeting and international conference on nondestructive testing, Hotel Morrison, Chicago. Society's address: 1109 Hinman Ave., Evanston, Ill. Secretary: Philip D. Johnson.

Nov. 4-5, Wire Reinforcement Institute Inc.: Annual fall meeting, Safari Hotel, Scottsdale, Ariz. Institute's address: National Press Bldg., Washington 4, D. C. Managing director: Frank B. Brown.

Nov. 4-6, American Institute of Electrical Engineers: Machine tool conference, Hotel Schroeder, Milwaukee. Institute's address: 33 W. 39th St., New York 18, N. Y. Secretary: N. S. Hibshman.

Nov. 4-6, American Institute of Mining, Metallurgical & Petroleum Engineers: Institute of Metals Division meeting, Morrison Hotel, Chicago. Institute's address: 29 W. 39th St., New York 18, N. Y. Secretary: E. O. Kirkendall.

Nov. 4-8, Society of Automotive Engineers: Fuels and lubricants, transportation, and diesel engine meetings, Hotel Statler, Cleveland. Society's address: 485 Lexington Ave., New York 17, N. Y. Secretary: John A. C. Warner.

Nov. 6-8, Grinding Wheel Institute and Abrasive Grain Association: Annual meeting, Sheraton-Blackstone Hotel, Chicago. Information: Hunter-Thomas Associates, 2130 Keith Bldg., Cleveland 15, Ohio.

Nov. 6-8, Scientific Apparatus Makers Association: Midyear meeting of laboratory apparatus and optical sections, Edgewater Beach Hotel, Chicago. Association's address: 20 N. Wacker Dr., Chicago 6, Ill. Executive vice president: Kenneth Andersen.

Nov. 6-8, Porcelain Enamel Institute: Annual shop practice forum, Ohio State University, Columbus, Ohio. Institute's address: 1145 19th St. N.W., Washington 6, D. C. Secretary: John C. Oliver.

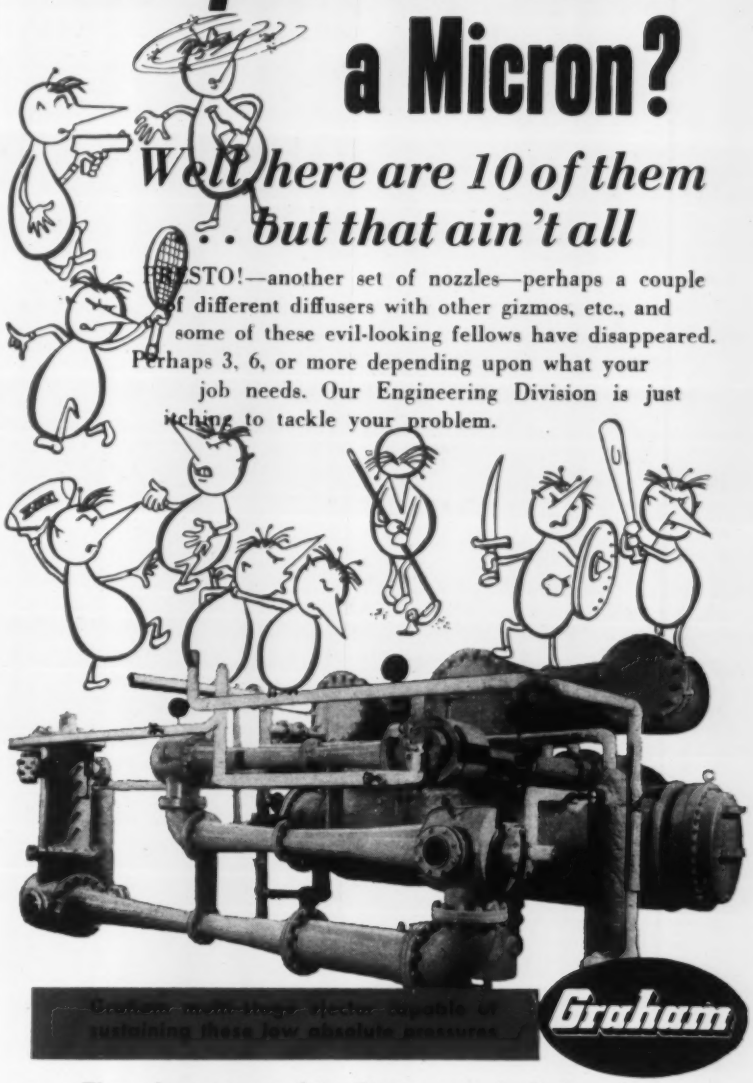
Nov. 8, American Iron & Steel Institute: Regional technical meeting, Mark Hopkins Hotel, San Francisco. Institute's address: 150 E. 42nd St., New York 17, N. Y. Secretary: George S. Rose.

Nov. 7-8, National Foundry Association: Annual meeting, Waldorf-Astoria Hotel, New York. Association's address: 53 W. Jackson Blvd., Chicago. Executive secretary: Charles T. Sheehan.

Nov. 11-13, Steel Founders' Society of America: Technical and operating conference, Carter Hotel, Cleveland. Society's address: 606 Terminal Tower, Cleveland 13, Ohio. Secretary: George K. Dreher.

Nov. 11-15, National Electrical Manufacturers Association: Annual meeting, Traymore Hotel, Atlantic City, N. J. Association's address: 155 E. 44th St., New York 17, N. Y. Managing director: Joseph F. Miller.

Did you ever SEE a Micron?



Well here are 10 of them . . but that ain't all

PRESTO!—another set of nozzles—perhaps a couple of different diffusers with other gizmos, etc., and some of these evil-looking fellows have disappeared. Perhaps 3, 6, or more depending upon what your job needs. Our Engineering Division is just itching to tackle your problem.

Graham

Through constant and intelligent research, Graham has refined the steam and gas propelled ejector until some would say that we had reached the ultimate—from our viewpoint, not so—we intend to go further. Our progress cannot halt—and to any industry that has a need for this exclusive equipment, we are prepared to demonstrate our guarantees.

We invite you to submit your problem to our Engineering Department without obligation and learn the economies and many advantages of the Graham Ejector for absolute pressures that are practically nil.

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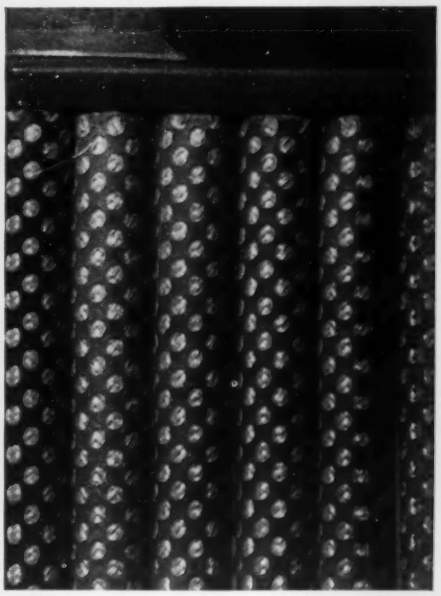
NEW TG EXIDE-IRONCLAD BATTERY SELLING AT RECORD LEVELS

Keeping up with sales. The busy shipping floor at the Exide plant. High volume production insures prompt delivery on all orders.



New tubular construction of positive plate. Holds more active material, gives you highest capacity per cubic inch of any industrial truck battery.

Electric industrial truck users buying it up for "greater economy" and "more power" advantages

Introduced only last April, the new TG Exide-Ironclad Battery is already selling at a faster rate than previous model Exides ever did in a similar period. Indications are that it is on its way to being the biggest selling electric industrial truck battery in history.

Experienced electric industrial truck users are the major buyers —the men who know batteries and see in the TG more value for their money. But in addition, there are truck users who are switching to this TG Exide-Ironclad Battery from cheaper but less economical makes.

If you want maximum economy and better performance in the operation of your electric industrial trucks, get the new TG Exide-Ironclad Battery. You can have more capacity in the same size or the same capacity in a smaller size at a lower cost. Call your nearby Exide representative. Or write for detailed bulletin. Exide Industrial Division, The Electric Storage Battery Company, Philadelphia 2, Pa.

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The Electric Storage Battery Company

structurally homogeneous

PARKER-KALON stress relieved socket screws

After controlled heating and equally controlled uniform quenching imparting maximum strength, P-K Socket Screws are carefully tempered to assure ductility, proper elongation and high impact strength. This is your assurance that . . . *If it's P-K . . . It's O-K!*

PARKER-KALON DIVISION, General American Transportation Corporation • Manufacturers of Socket Screws, Self-tapping Screws, Screwnails, Masonry Nails, Wing Nuts and Thumb Screws.

Sold Everywhere Through Leading Industrial Distributors — Factory: Clifton, New Jersey • Warehouses: Chicago, Illinois; Los Angeles, California

PARKER-KALON® fasteners

Flag-raising day at another great new Olin Aluminum plant

Cradled in the heart of the Ohio River Valley, this expansive industrial giant is about to spring to life.

Ultra-modern from the ground up, this huge new Olin Aluminum Sheet Mill within a few short months will add its production to the vigorous mainstream of quality Aluminum flowing to the nation from four Olin Aluminum plants.

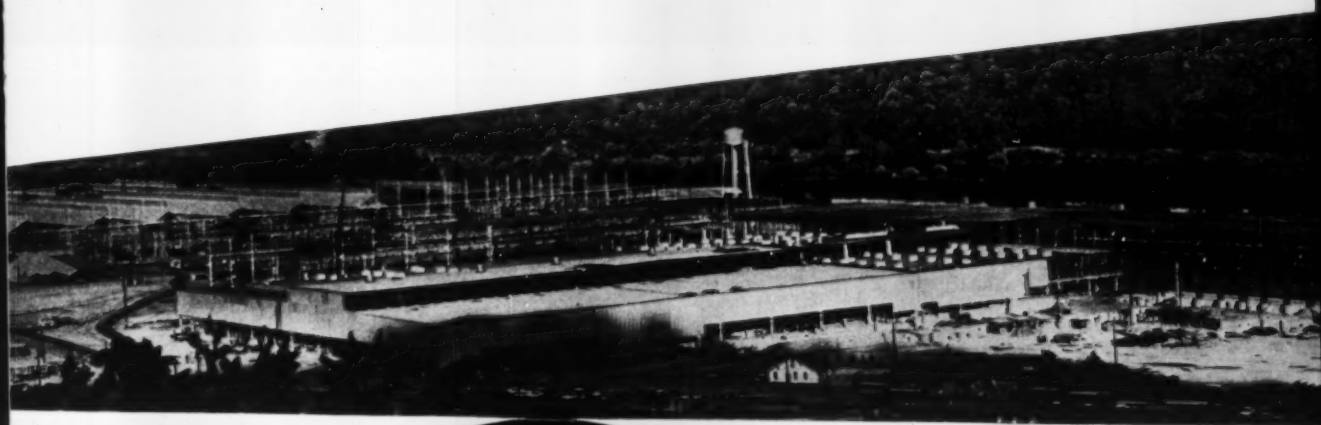
Flag-raising day at this giant new mill will mark an important new chapter in the exciting 22-month growth of Olin Aluminum. New ore ships, rolling mills, extrusion plants and wire and cable mills are already in operation or under construction. With these modern, fully-integrated facilities, Olin Aluminum is right now on the way to an initial annual volume of 340 million pounds of quality Aluminum. And that is only the beginning.

This new Aluminum will be custom-tailored to your specifications. And the unique standards of quality and service by which it will be produced and delivered to you will help you simplify your manufacturing procedures and achieve maximum efficient production from each pound you use.

If this is the kind of quality and service you have long been looking for, write now for product availabilities to our new permanent sales headquarters: Aluminum Division – Sales, Olin Mathieson Chemical Corporation, 400 Park Avenue, New York 22, New York.

OLIN ALUMINUM

Symbol of new Standards of Quality and Service in the Aluminum Indus



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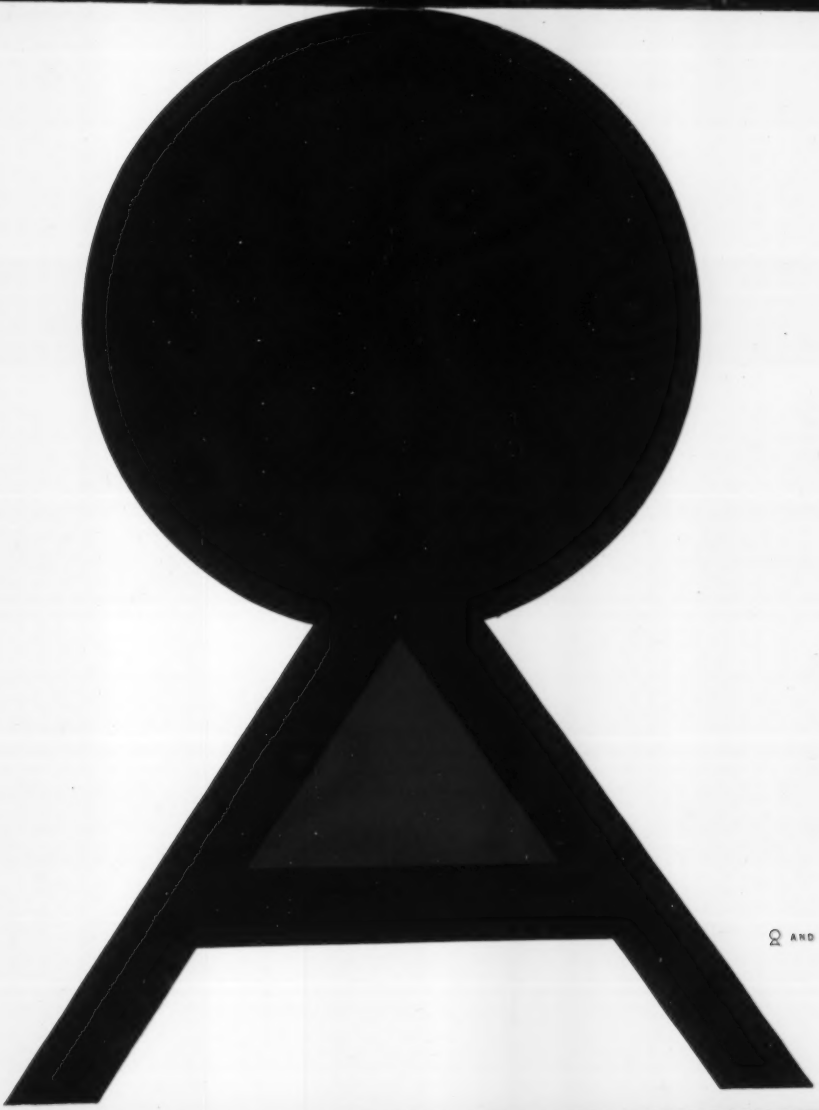
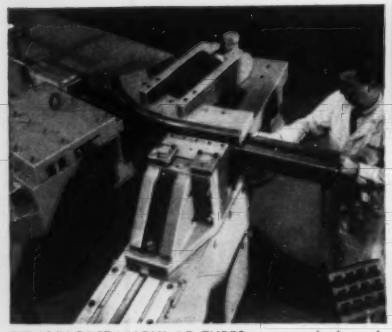
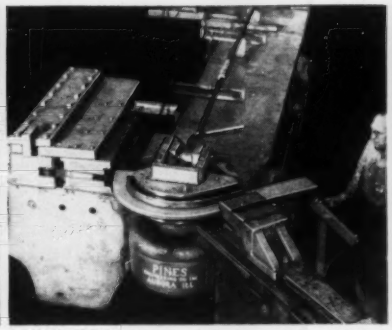


AND "OLIN ALUMINUM" ARE TRADEMARKS



HEAVY RECTANGULAR TUBES—accurately formed on Pines Model 4 on a 24" inside radius for air cushion assembly on heavy duty truck chassis. Material is 4" x 5½" x .200" wall.



SOLID STEEL BEAMS—cold edge bending of 5½" x 1¼" steel bars on Pines Model 4 replaces hot bending on dozer, produces more accurate parts at lower cost for road machinery manufacturer.

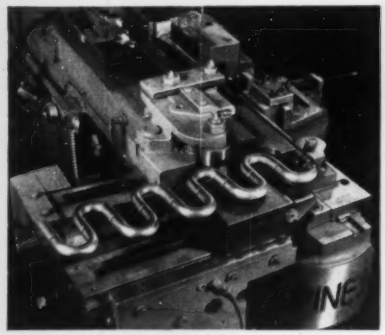
ALUMINUM CHANNELS—rugged machine construction and tooling on Pines Model 3 Machine cold forms 4" x 1¾" x .320" aluminum channel without wrinkling or distorting. Spring-back is controlled by simple machine settings.

FOR COST CUTTING IDEAS

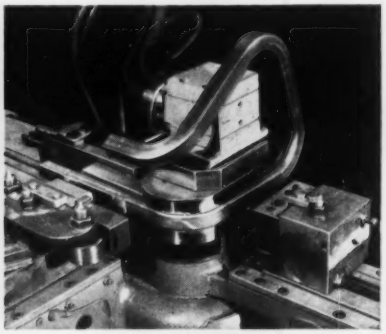
INVESTIGATE PRODUCTION BENDING THE "PINES-WAY"

When you have a production job requiring the cold forming of parts from round, square, rectangular, extruded, or hollow stock to an even radius; or to different angles, we suggest you investigate the cost cutting advantages of production bending the Pines-way. The examples shown here illustrate a few of the many different and varied applications which are today profitably produced on Pines machines. Cold bending is a fast, accurate, easy to control metal forming process that is today more profitably applied in the production of an ever increasing variety of products. Call on Pines engineers for assistance without obligation on any specific job.

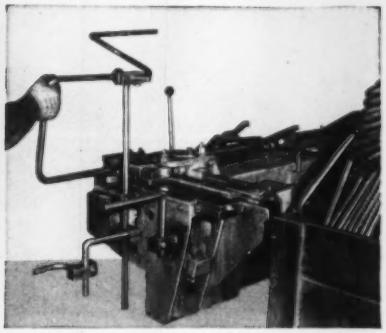
SEE OUR EXHIBIT
BOOTH 1675
ASM SHOW
Nov. 4-8
CHICAGO



COPPER SERPENTINE BENDS—¾" O.D. x .035" copper tubing is rapidly formed on this Model ¾ into serpentine coils on a 1" clr. A simple gang-slitting operation produces 180° return bends.



WRINKLE-FREE SQUARE TUBE BENDING—Model 1 Machine, equipped with flexible mandrel and self-opening bending form, produces top quality office and hospital equipment at speeds of 250 bends per hour.



FAST ROUND-TUBE BENDING—Pines Model ¾ Machines speed production of tubular dinette and lawn furniture. Fast, automatic cycling and accurate progressive bending produce 600 to 900 bends per hour.

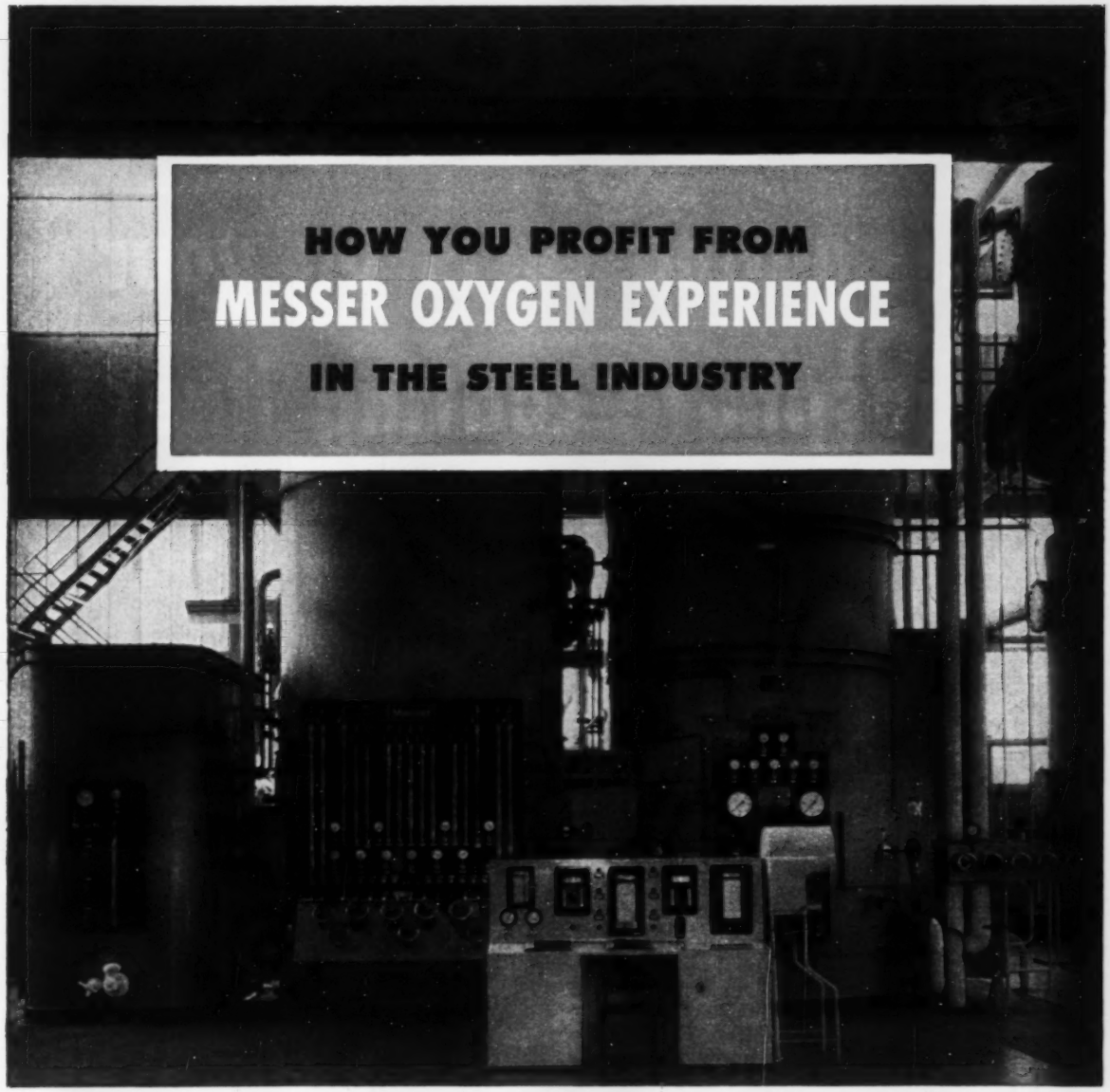
PINES ENGINEERING CO., INC.

Specialists in Tube Fabricating Machinery 662 WALNUT • AURORA, ILLINOIS

WRITE FOR FREE DATA SHEETS

To keep abreast with bending, write for free copies of "Pines News" — gives complete data on new production applications.

PRODUCTION BENDING • DEBURRING • CHAMFERING MACHINERY



HOW YOU PROFIT FROM MESSER OXYGEN EXPERIENCE IN THE STEEL INDUSTRY

In the steel industry, continuous operation is the key to efficient production. Messer's long and broad experience in the engineering of oxygen plants means dependable, month after month, production—and MONEY SAVED.

For example, here is a report from Cockrill-Ougre (Luxembourg) on Messer dependability:

(from a letter dated November 19, 1956)

"... We are confirming that the installation of a plant of 80 tons per day capacity, which you furnished, has been functioning at our facilities since February of 1954. After small adjustments during start-up, two periods of uninterrupted service of 12 and one-half months were obtained.

Gentlemen, we are most happy to express our distinct satisfaction."

In the United States and abroad, more than 1500 Messer Oxygen plants are performing efficiently and dependably. May we give you more information?

AMERICAN MESSER CORPORATION

CHRYSLER BUILDING, 405 LEXINGTON AVENUE • NEW YORK, N.Y.

"THERE IS NO SUBSTITUTE FOR MESSER EXPERIENCE"

Want to SAVE up to 70% of heating costs on your phosphate coating line?

new Parker Cold Bonderite System does it!

Turn down the heat! Put most of your Bonderite line heat costs back in the till! Parker Rust Proof Company has developed a new Bonderite system for low temperature operation.

It includes a new cold alkaline cleaner that works beautifully at 70° and is effective in a temperature range from 60° to 120°. A new Spra-Bonderite, specially formulated to produce a superior coating at low temperatures, has been developed to work in conjunction with the new Parker cold cleaner.

With the new cold Bonderite system, savings are really sizable. Heat consumption in the line is cut by as much as 70%. Cost of the new Parker system is approximately equal to conventional alkali cleaners and phosphate coating chemicals, so the savings in heat are practically all velvet. It is estimated that on an average automobile body line the savings in steam costs can run as high as 10 to 12 cents per body; on an average refrigerator line 4 to 5 cents per cabinet. Savings in B.T.U.s can mean savings in dollars.

The new cold Bonderite system has been production-tested in mass production plants. Its performance has amazed the experts. It's ready to go to work in your plant, saving you money, right now!

Why go on paying for heat you don't need? Start using Parker's new cold Bonderite system. A letter or phone call will bring a Parker man with full, money-saving details.

*Bonderite, Bonderlube, Parco, Parco Lubrite—Reg. U.S. Pat. Off.

PARKER RUST PROOF COMPANY
2158 E. MILWAUKEE, DETROIT 11, MICHIGAN

Since 1914 — leader in the field

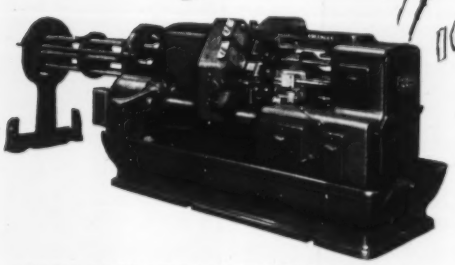
BONDERITE	BONDERITE and BONDERLUBE	PARCO COMPOUND	PARCO LUBRITE	TROPICAL
corrosion resistant paint base	aids in cold forming of metals	rust resistant	wear resistant for friction surfaces	heavy duty maintenance paints since 1883

Dependable...

PRODUCTION MACHINERY

GREENLEE

Automatic Bar Machines



BOOST PRODUCTION
REDUCE DOWN TIME

It's easy to maintain rigid production schedules . . . prevent costly bottlenecks with Greenlee Bar Automatics. They are always on the job . . . give continuous, reliable service.

You hear much comment about Greenlees' uninterrupted, round-the-clock performance in widely different industries. With good reason, too, for Greenlee offers years of manufacturing experience... plus manufacturing integrity not often duplicated.

Want complete information? Call in the Greenlee man. Let him give you the complete story. Please submit a print when inquiring about a specific job.

SIX AND FOUR-SPINDLE AUTOMATIC BAR MACHINES

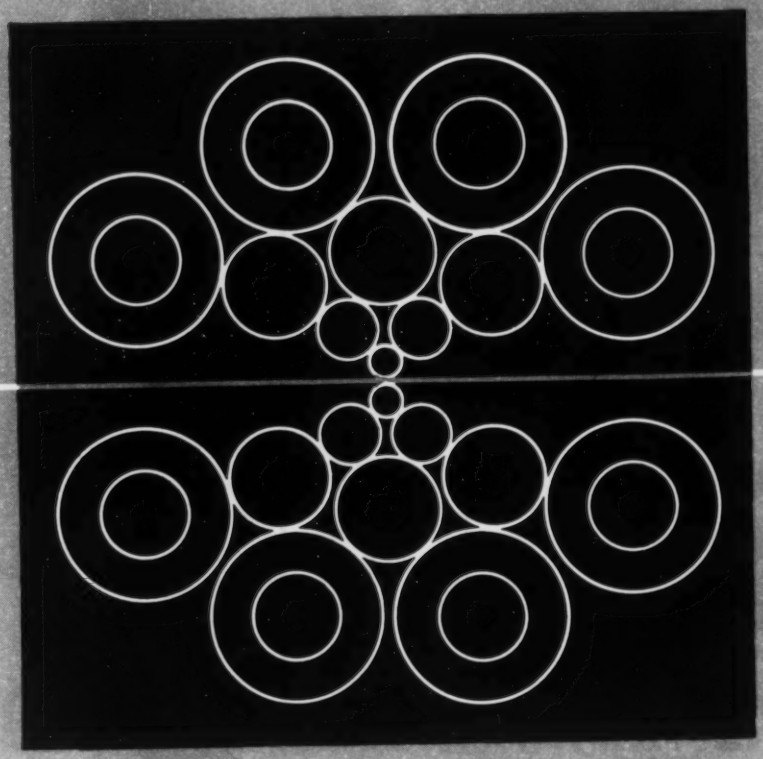
GREENLEE Special Machine Tools

- Multiple-Spindle Drilling and Tapping Machines
- Transfer-Type Processing Machines
- Hydro-Borer Precision Boring Machines

WRITE FOR CATALOG No. A-405

GREENLEE BROS. & CO.

1931 MASON AVENUE
ROCKFORD, ILLINOIS



EASTERN PUTS THE SQUEEZE ON STAINLESS STEEL

SENDZIMIR-PRODUCED STAINLESS STEEL

now available in thicknesses down to .007″ and widths up to 48″

As the world's largest exclusive producer of stainless steel sheets and plates it is natural that Eastern would be among the first to produce stainless by the Sendzimir method.

The unusual design of the Sendzimir mill with its small work rolls and series of force-transmitting back-up rolls removes many of the present limitations in the cold rolling of stainless steel.

Production from Eastern's new Sendzimir cold reduction mill rolls off the line in gauges and widths that until recently were impossible to obtain. Gauges held to extremely close tolerances are ideal for use in the supersonic aircraft and missile fields as well as broadly diversified areas in other fabricating industries.

Eastern invites you to explore new applications for the close tolerances and bright finishes of Sendzimir-produced stainless steels. Send for Eastern's new Specification Booklet or consult the Customer Service Department.

EASTERN STAINLESS STEEL CORPORATION

Baltimore 3, Maryland, U.S.A.

NOW—THREE "CHROMTEMP" EXOTHERMIC FERROCHROMES

for large ladle additions— up to 2% chromium

With these advantages

- **uniformly high chromium recoveries —87% to 95%**
- **close analysis control**
- **fast solubility**
- **no weighing—just count cans containing exact amounts of alloy**
- **palletized shipment for convenient handling**

"CHROMTEMP" 5
Adds only 0.05% carbon for each 1.00% chromium addition, a 20-to-1 chromium-to-carbon ratio.

"CHROMTEMP" 8
Adds only 0.08% carbon for each 1.00% chromium addition, a 12.5-to-1 chromium-to-carbon ratio.

"CHROMTEMP" 12
Adds only 0.12% carbon for each 1.00% chromium addition, an 8-to-1 chromium-to-carbon ratio.

Check ELECTROMET—for experienced technical assistance... fast deliveries... a complete line.

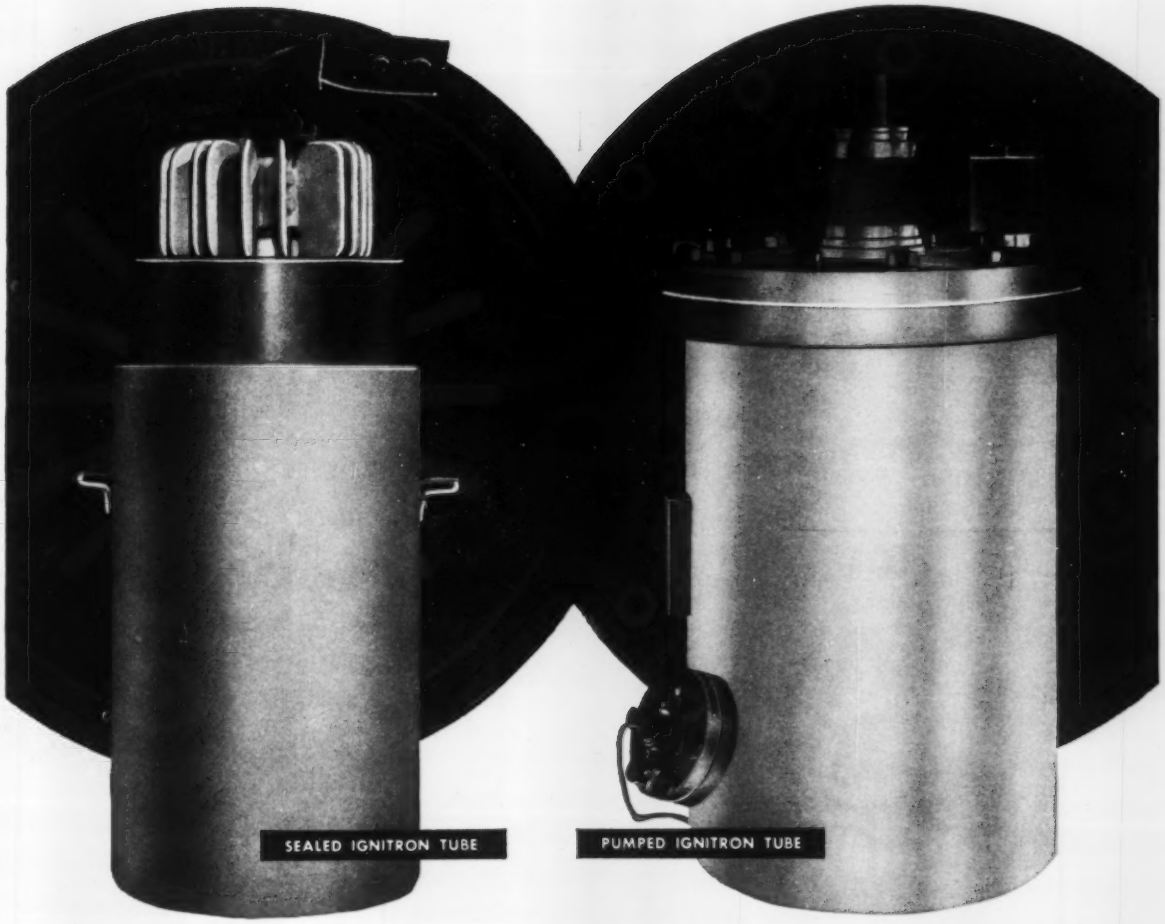
Write ELECTRO METALLURGICAL COMPANY, Division of Union Carbide Corporation, 30 E. 42nd Street, New York 17, N. Y. *In Canada:* Electro Metallurgical Company, Division of Union Carbide Canada Limited, Toronto.

METALS DO MORE ALL THE TIME ...THANKS TO ALLOYS

Electromet
FERRO-ALLOYS AND METALS

UNION CARBIDE

The terms "Chromtemp," "Electromet," and "Union Carbide" are registered trade-marks of Union Carbide Corporation.



5 MILLION KW's CAN'T BE WRONG ...IGNITRONS ASSURE RELIABLE D-C POWER

Behind this unequalled record for reliable d-c power is the Westinghouse-invented and perfected Ignitron tube.

There are no major moving parts . . . no brushes, commutators or collector rings to wear and replace. Continuity of power is further assured by its high overload capacity. The Ignitron can repeatedly handle high load swings without increased maintenance.

And in addition to a trouble-free design, the Westinghouse Ignitron rectifier is relatively unaffected by a-c system disturbances—instantly available and never requires synchronizing. Because of these and other advantages, more than 5,000,000 kilowatts of Ignitrons have furnished reliable d-c power to plants in the steel and general industries.

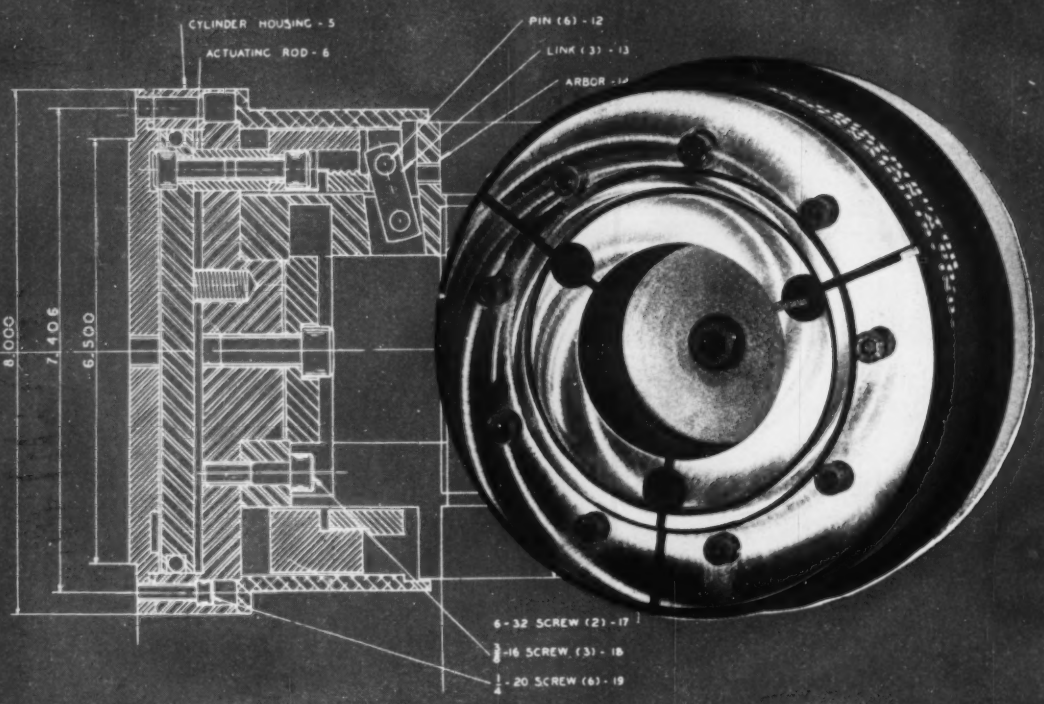
Ask for your copy of Ignitron booklet B-7008. It describes such outstanding features as compactness, safety and low installation cost. Contact your Westinghouse representative or write Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pennsylvania. J-15006

Ignitron Unit Substation showing anode breaker, Ignitron rectifier and d-c switchgear

YOU CAN BE SURE...IF IT'S

Westinghouse

Arbors, links, jaws, and often the air cylinders of these Stace-Allen precision air chucks are made of Crucible MAX-EL. Manufacturer: Stace-Allen Chuck Company, Indianapolis, Ind.



nondeforming, easy-machining MAX-EL alloy steel chosen for precision chuck parts

Several components of Stace-Allen precision air chucks, which are made of Crucible MAX-EL® alloy steel, are finish machined *after full heat treatment*. This can be done because MAX-EL machines easily, even at hardnesses as high as 352 Brinell—or higher, with special tooling.

Other components, on the other hand, are machined, then heat treated. MAX-EL is used here because Stace-Allen finds there is minimum distortion in these parts after hardening.

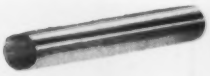
But try MAX-EL for yourself. Whether your production schedule calls for machining-then-hardening—or the other way around—you'll find easy-machining, nondeforming MAX-EL a natural selection. Call your local Crucible warehouse for quick delivery of MAX-EL in the grade or size you need. And for more MAX-EL facts, write us for a free Data Sheet. *Crucible Steel Company of America, The Oliver Building, Mellon Square, Pittsburgh 22, Pa.*

CRUCIBLE first name in special purpose steels

Crucible Steel Company of America

Working with foreman Bill Todd (right) of Whitin Machine Works, Whitinsville, Mass., Bay State distributor, Vic Ericson (left) of Johnson deVou, Worcester, Mass., helped cut Whitin's grinding costs thousands of dollars per year.

They made 1 wheel do the work of 12



Centerless grinders at Whitin Machine Works were handling parts 1/8" to 5" diameter in bronze, brass, aluminum, cast iron, Meehanite and various steels. Short runs averaged between 3 and 300 pieces. With a dozen different wheels in use, the opportunities for savings on wheel changes alone are tremendous.

Department foreman Bill Todd wanted to simplify. He was looking for *a single all-purpose wheel that would eliminate all wheel changes due to varying job requirements.*

For a while it looked as though he was asking the impossible. But Bay State distributor Vic Erickson went to work with the sales engineering staff at Westboro and came up with a solution . . . a single wheel that handles the entire range of sizes and metals with only one dressing an hour. Finishes average #16RMS . . . go as fine as #2 with special care.

Whatever your company's abrasive problems may be, you'll find Bay State representatives ready to help and competent to work out practical solutions.

BAY STATE WHEELS of PROGRESS

BAY STATE ABRASIVES

Bay State Abrasive Products Co., Westboro, Mass.
Branch Offices and Warehouses: Bristol, Conn., Chicago, Cleveland, Detroit, Pittsburgh.
Distributors: All principal cities. Bay State Abrasive Products Co. (Canada) Ltd., Brantford, Ontario

compact . . . power-packed

New General Electric

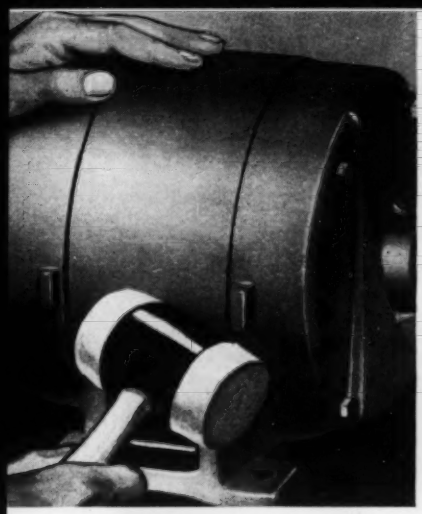
NOW EASIER

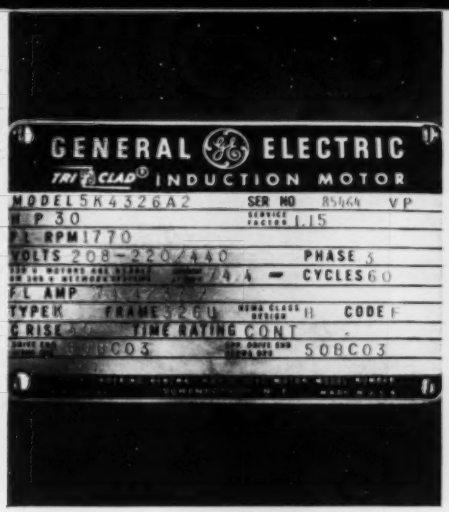
COMPLETE LINE AVAILABLE

TRI 55 CLAD Motors are . . .

TO MAINTAIN

THROUGH 125-HORSEPOWER





FAST END-SHIELD REMOVAL is possible because of Tri-Clad '55' motor's rugged knock-off lugs. Remove four bolts, tap on knock-off lugs and end-shield is off to permit easy repositioning or quick motor inspection.

EASIER TO MAINTAIN, Tri-Clad '55' motors utilize a stainless-steel, non-corrosive nameplate to give complete rating information including AFMBA bearing numbers. Separate steel plate gives connection diagrams.

EASIER TO INSTALL, Tri-Clad '55' motors use Perma-numbered leads to simplify wiring, speed motor hook-up. Numbers are stamped on terminals and printed on every half-inch of Geoprene® leads.

immediate shipment . . . all ratings

The need for faster production schedules and reduced production costs has made motor maintenance of prime concern to motor users. Modern motors must be easy to inspect and maintain without loss of production time due to routine maintenance.

TO MEET THIS NEED, G-E Tri-Clad '55' motors feature an oversize grease reservoir which contains enough grease for normal 5-year operation. Yet, new grease can be added while the motor is running. Other easy maintenance features are described above.

EASE OF MAINTENANCE, however, is not the whole Tri-Clad '55' motor story. Experienced G-E motor engineers have used revolutionary materials and the most modern production and testing facilities to provide a motor that is not only easier to maintain, but also more reliable and easier to install.

Formerly available only to 30-hp, these proven Tri-Clad '55' motors are now available for immediate shipment—usually from nearby warehouse stocks—up through 125-hp.

FOR FULL INFORMATION on the complete Tri-Clad '55' motor line contact your nearest G-E Apparatus Sales Office or Distributor.

Section H 891-7
GENERAL ELECTRIC COMPANY
Schenectady 5, New York

Please send me the following publications:

☐ **FREE BULLETIN (GEA-6602) describes advanced features of new Tri-Clad '55' motors through 125-hp.**

☐ **FREE SLIDE RULE (GEN-148) to determine weight and space-saving benefits of new Tri-Clad '55' motors.**

NAME _____

TITLE _____

COMPANY _____

ADDRESS _____

CITY & STATE _____

Progress Is Our Most Important Product

GENERAL ELECTRIC

Why jet engines are harnessed with *Carpenter* Welded Stainless Tubing

Reason One: For measuring their exhaust temperature. They're harnessed with the circular assembly of 1″ O.D. Type 430 Carpenter Tubing shown above. Inside it are two wire loops connected to thermocouples on the engine tail-cone. Made in diameters of 12″ to 36″, this harness has to withstand up to 1000-degree heat, corrosive fuel and atmosphere, engine shock and vibration.

Reason Two: Type 430 Carpenter Tubing provided *more* than the strong resistance to heat, corrosion and shock, and the low coefficient of expansion required in this punishing service. Being *welded* tubing, its uniform walls, working properties and dimensional accuracy to 0.003″ throughout were important production advantages for the "harness-maker". Precise bending, flaring and other fabricating operations were accomplished trouble-free.

Next time you need stainless tubing for pressure, corrosion resistance, mechanical, structural or sanitary requirements, call in your nearby Carpenter Representative or Distributor. Have him tell and show you why the quality and uniformity of the welded tubing he sells saves time, trouble and money. Meantime, send for Selecting and Buying Guide, Bulletin T.D. 120.

You are sure of getting all these tubing advantages from Carpenter:

• Uniform wall thickness throughout the length of the tube • Smooth surfaces, I.D. & O.D. • Uniform analysis • Guaranteed 100% pressure tight • Maximum workability • Full corrosion resistance throughout • Heat exchanger quality • Widest range of analyses • Lower initial cost.

The Carpenter Steel Company, Alloy Tube Division, Union, N. J.

Export Dept.: The Carpenter Steel Co., Port Washington, N.Y.—"CARSTEELCO"

Carpenter

Stainless Tubing & Pipe

"This used to take hours...

now the whole gearcase comes off in minutes!" Quite an accomplishment for an enclosed eccentric press. Too often the advantages of the enclosed design are gained by sacrificing the accessibility of the open design. Not so with Bliss, however: Bliss engineers count practical maintenance a design "must"—any new design that comes off the boards at Bliss keeps the maintenance man in mind.

Which is one more reason why industry agrees, "Bliss is more than a name ...it's a guarantee."

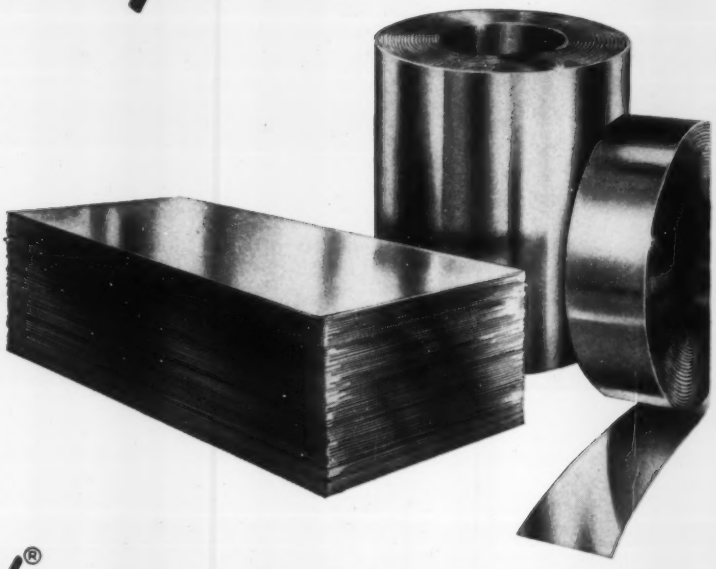
BLISS
SINCE 1837

E. W. BLISS COMPANY · Canton, Ohio

100 years of making metal work for mankind

PRESSES • ROLLING MILLS • MILL ROLLS • DIE SETS • CAN MACHINERY • ORDNANCE

Wherever you are you get *quick personal service*



when you order *MicroRold*® Stainless Steel Sheet & Strip

SPECIFICATIONS

	WIDTH	THICKNESS
SHEETS	up to 36″	.005 to .109
	up to 48″	.010 to .109
STRIP	up to 23 15/16″	.0015 to .009
GRADES:	201, 202, 301, 302, 304, 305, 316, 321, 347, 403, 410, 430 and Micro-Mach (special extra-high-tensile aircraft grade)	

Any one of the 305 independent steel warehouse distributors stocking MicroRold Stainless Steel is ready to serve as your *personal* stainless procurement representative. Located strategically in the U. S. A., Canada and Europe, your MicroRold distributor carries a variety of grades, widths, thicknesses and finishes and is fully qualified to assist you in the selection and fabrication of the most suitable stainless grade for your particular requirements.

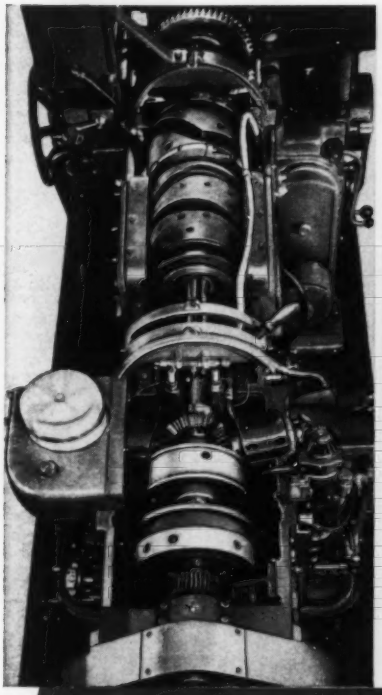
Your MicroRold stainless steel distributor assures you of the fastest possible deliveries with an absolute minimum of red tape in order processing. If he is unable to fulfill your needs from stock he has available direct and immediate service from our mill. In cases of emergency, it is possible for us to roll and ship MicroRold Stainless Steel the same day the order is received.

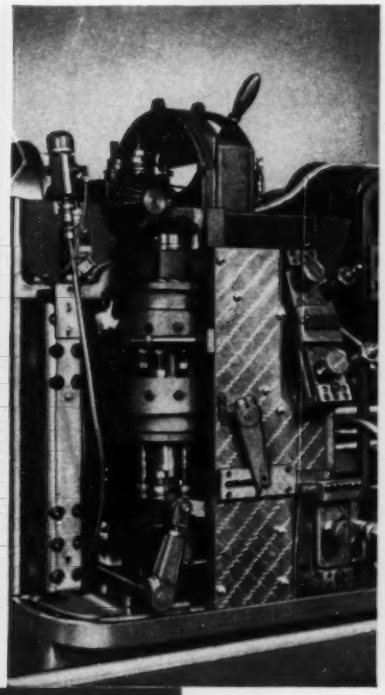
You can rely on MicroRold service as a dependable source of supply, either mill or distributor delivery.

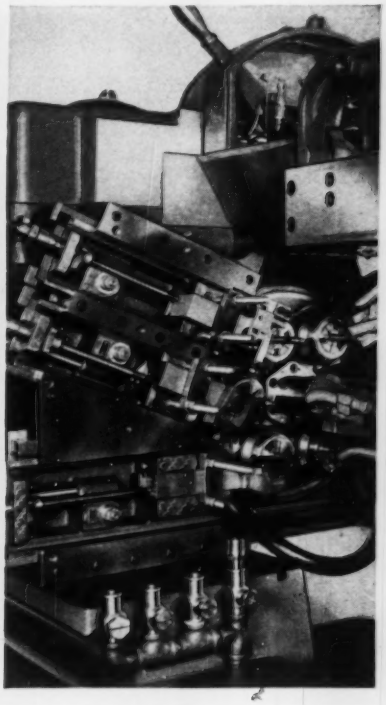
Write, wire or phone today for the name of your nearest MicroRold Stainless Steel Distributor.

WASHINGTON STEEL CORPORATION

11-O WOODLAND AVENUE WASHINGTON, PENNSYLVANIA







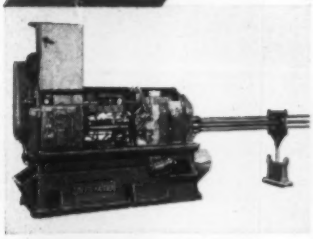
7

Seven Fast Changeover Models

With the prospects of improved tool materials ever decreasing the actual machining time of work on Multiple Spindle Automatics, long runs tend to become short runs. Facility that decreases the time for job change becomes more important to low-cost production.

Conomatics are available in as many as seven fast changeover models. These are the 9/16", 1", 1⅝" Sixes, and the 2⅝", 3½", 5", and 5¼" Fours.

These models are equipped with dial adjustment of working stroke of all slides, without making necessary change of total stroke or positive stop settings. Write, wire, or phone for literature descriptive of these features and other facilities available to users, or prospective users.



Conomatic

CONE AUTOMATIC MACHINE COMPANY, INC., WINDSOR, VT., U. S. A.

MANSFIELD, OHIO, KNOWS *CCC

Yes, Mansfield is well aware of Commercial Contracting Corporation's team of specialists. That's the town where CCC installed the presses and machine tools in the nation's largest stamping plant. These heavy presses are turning out body stampings for America's major builder of motor cars.

CCC won the job through experience in installing automated equipment . . . for world leaders in the production of steel, aluminum and automobiles.

Industrialists all across America know that CCC is prominent in important plant installations of the post-war expansion era. They rely on the talents and techniques, the experienced supervision and precise organizing that CCC brings to every job. If your company is planning the removal, relocation or installation of machinery, turn the job over to CCC. Your project will be completed *quickly, economically* and *efficiently*.

CCC services, individually or under one Package Contract, include: Press Erecting • Rolling Mill Installation • Machinery Installation and Moving • Foundry Installations • Overhead Crane Installation • Mothballing.

Write for new illustrated brochure.

*COMMERCIAL CONTRACTING CORPORATION CCC INDUSTRIAL INSTALLATIONS

12160 CLOVERDALE • DETROIT 4, MICHIGAN • TExas 4-7400

The new automatic welding process everybody likes

"WE FOUND THAT DUAL SHIELD WELDING WAS JUST THE THING WE NEEDED TO MAKE A PRODUCTION LINE JOB POSSIBLE" ----- "THE DUAL SHIELD PROCESS IS SIMPLIFIED TO THE POINT WHERE A MAN CAN LEARN TO DO A GOOD JOB WITHIN A DAY'S TRAINING" ----- "DUAL SHIELD WELD GIVEN 40 HOUR VIBRATION TEST AND SHOWED NO FAILURES" ---- "FOR OUR WORK DUAL SHIELD WELDING IS 50 PER CENT FASTER THAN CONVENTIONAL WELDING METHODS INCLUDING SET UP TIME . . . ALSO 50 PER CENT CHEAPER" ---- "IT ENABLES US TO DO WORK THAT FORMERLY WASN'T PROFITABLE BECAUSE OF THE HIGH WELDING COST" ---- "WE NOW MAKE WELDS ON TANKS AT RATE OF APPROXIMATELY 105 FEET PER HOUR. PREVIOUSLY OUR BEST WELDING SPEED WAS APPROXIMATELY 50 FEET PER HOUR" ---- "DUAL SHIELD PROCESS CUTS OUR COST BY 25%" --- "I LIKE THE CLEANER AND SMOOTHER WELD THAT DUAL SHIELD SYSTEM GIVES IN ADDITION TO THE MINIMIZING OF SPATTER DURING THE WELDING PROCESS" --- "IT CU PATTER AND GIVES US A NEAT FINISHED JOB" ----- "ONE OPERATOR IS DO EN IN THE SET UP AT OUR PLANT"

NCG®

DUAL SHIELD*

The DUAL SHIELD process is something *new* in welding, something dramatically *new*, something dramatically *better!* It's the new welding process that takes the guesswork and mistakes out of welding by *automatic* control. The proper arc voltage is maintained automatically. The electrode is fed to the work automatically. The weld is automatically protected from contamination, both during deposition and during cooling.

Weldors praise the DUAL SHIELD process; they can do better work faster and with less effort and strain. Welding shops like DUAL SHIELD; it not only cuts costs and avoids waste, it often opens entirely new opportunities for welded construction. Buyers of DUAL SHIELD welded products like them because of the cleaner, neater welds. Read what users of the DUAL SHIELD process say. Try this process on your work. You too will be an enthusiast.

PLEASE TURN THE PAGE.....

NCG® DUAL SHIELD*

(the new automatic process everybody likes)

WELDING

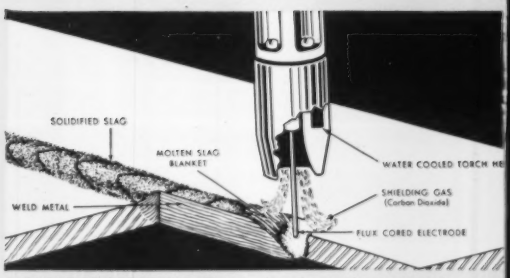
Science takes the guesswork out of welding with the NCG DUAL SHIELD process. Now, better welds are produced continuously because electrode feed and current density are set and held automatically . . . and because the weld is *completely* protected from atmospheric contamination, not only during deposition but during cooling as well.

In NCG DUAL SHIELD welding, inexpensive carbon dioxide gas is automatically fed to the arc to blanket and prevent contamination of the weld. The special flux-cored electrode is fed automatically and continuously from a reel. The flux is never in the way, never hides the weld. The DUAL SHIELD flux-cored electrode affords *absolute control of the amount of flux in the arc.* This is important in order to maintain accurate control of weld chemistry and assure a metallurgically uniform weld deposit. The slag "pops" off as the molten weld metal cools, and the weld can be easily cleaned with a wire brush.

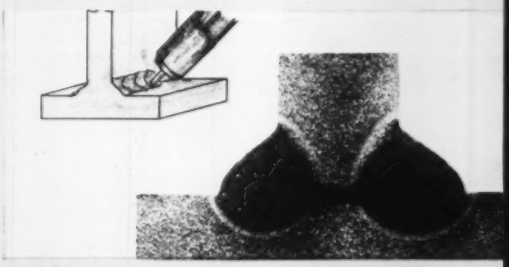
The DUAL SHIELD process is designed primarily for welding all plain carbon steels up to .35% carbon content and type T-1 and A202 steels. It can be used for single-pass welds in the horizontal and flat positions on thicknesses from 3/32" to 1/2". In addition, it is possible to make 1/4" fillet welds at more than 20 ipm and butt welds on 1/4" plate at more than 30 ipm . . . all continuously for foot after foot of exceptionally high quality weld. And, with the DUAL SHIELD process, no cleaning preparation is necessary for welding scaly, oily or rusty steel. The material is cleaned automatically as it is welded.

AUTOMATIC or AUTOMANUAL*

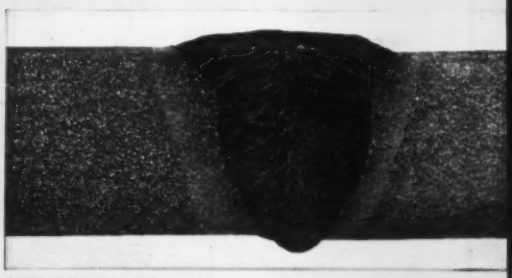
The DUAL SHIELD process is accomplished with the NCG Sureweld welding equipment. The basic Sureweld Type SA-1 outfit is for "Automanual" welding. It consists of electronic welding control, electrode drive, welding gun, and the gas and water cable assemblies. Conversion kits enable you to easily convert this to fully automatic welding. The DUAL SHIELD process makes fully automatic production welding most feasible. It is only necessary to traverse the gun or the work mechanically.



DOUBLE PROTECTION: Flux in the electrode core and a shield of CO_2 work hand-in-hand to produce sound, uniform and clean welds.



UNIFORM WELDS: Once settings are made, the DUAL SHIELD process makes smooth, uniform welds even on scaly, oily or rusty steel.



DEEP PENETRATION: A process feature is its ability to make one-pass welds in mild steel up to ½-in. thick.

NOW . . .
New DUAL SHIELD Welding Bulletin

Just off the press . . . the completely new explanatory literature Bulletin NH-137. Get all the facts . . . complete and detailed description of the equipment and the process . . . case histories . . . all clearly illustrated. Use the coupon or write . . .

NATIONAL CYLINDER GAS COMPANY
840 N. Michigan Ave., Chicago 11, Ill.

Please send me the NCG Bulletin NH-137.

NAME_____

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NCG®

NATIONAL CYLINDER GAS COMPANY
840 North Michigan Avenue,
Chicago 11, Illinois
Branches and Dealers from Coast to Coast

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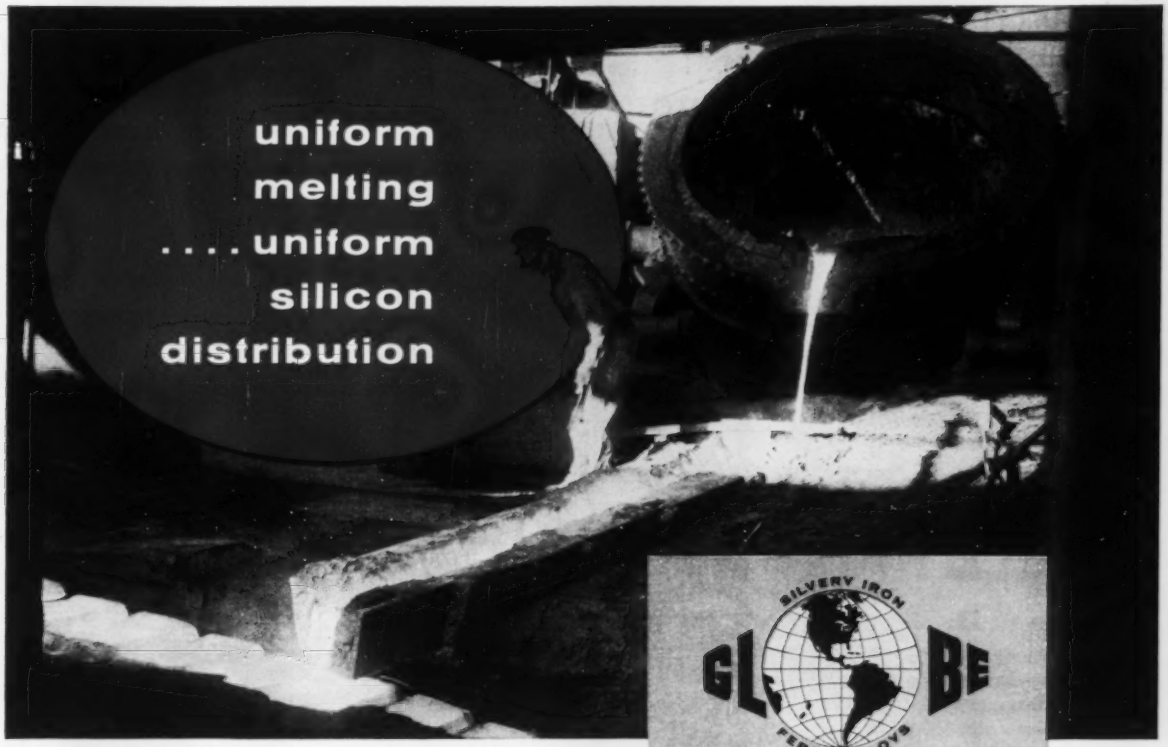


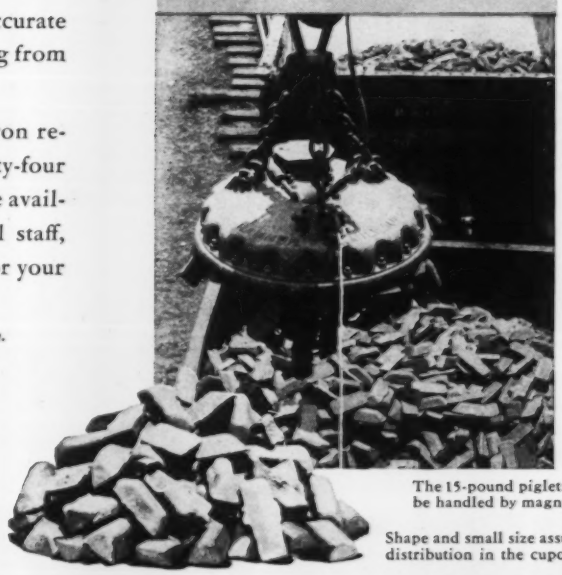
Globe Silvery piglets are cast from all-virgin ore.

Globe Silvery Pig Iron provides accurate silicon control with all grades ranging from 6% to 16% silicon.

Originated in 1872, Globe Silvery Iron remains, today, in a class by itself. Eighty-four years of research and development are available, through a skilled metallurgical staff, to help you select the correct grade for your requirements.

Service Department available without obligation.

SILVERY IRON GLOBE FERRO ALLOYS



The 15-pound piglets can easily be handled by magnet or hand.

Shape and small size assure even distribution in the cupola.

PICKANDS MATHER & CO.

CLEVELAND 14, OHIO

CHICAGO • CINCINNATI • DETROIT • DULUTH
ERIE • GREENSBORO • ST. LOUIS • WASHINGTON

Serving Industry Since 1883

IRON ORE • PIG IRON • COAL • COKE • FERROALLOYS

Allis-Chalmers announces... **Newly**

1

Gang-operated disconnect switch isolates starter from incoming power — assures safe entry of high voltage compartments.

2

Steel cubicle is compartmentalized — separates high and low voltage equipment.

3

Short-circuit protection is provided by fast-acting current-limiting fuses, rated 150,000 kva at 2300 volts and 250,000 kva at 4160 or 4600 volts.

4

Overload protection is handled by accurate relays which trip only on excessive motor current, preventing needless motor stoppages.

5

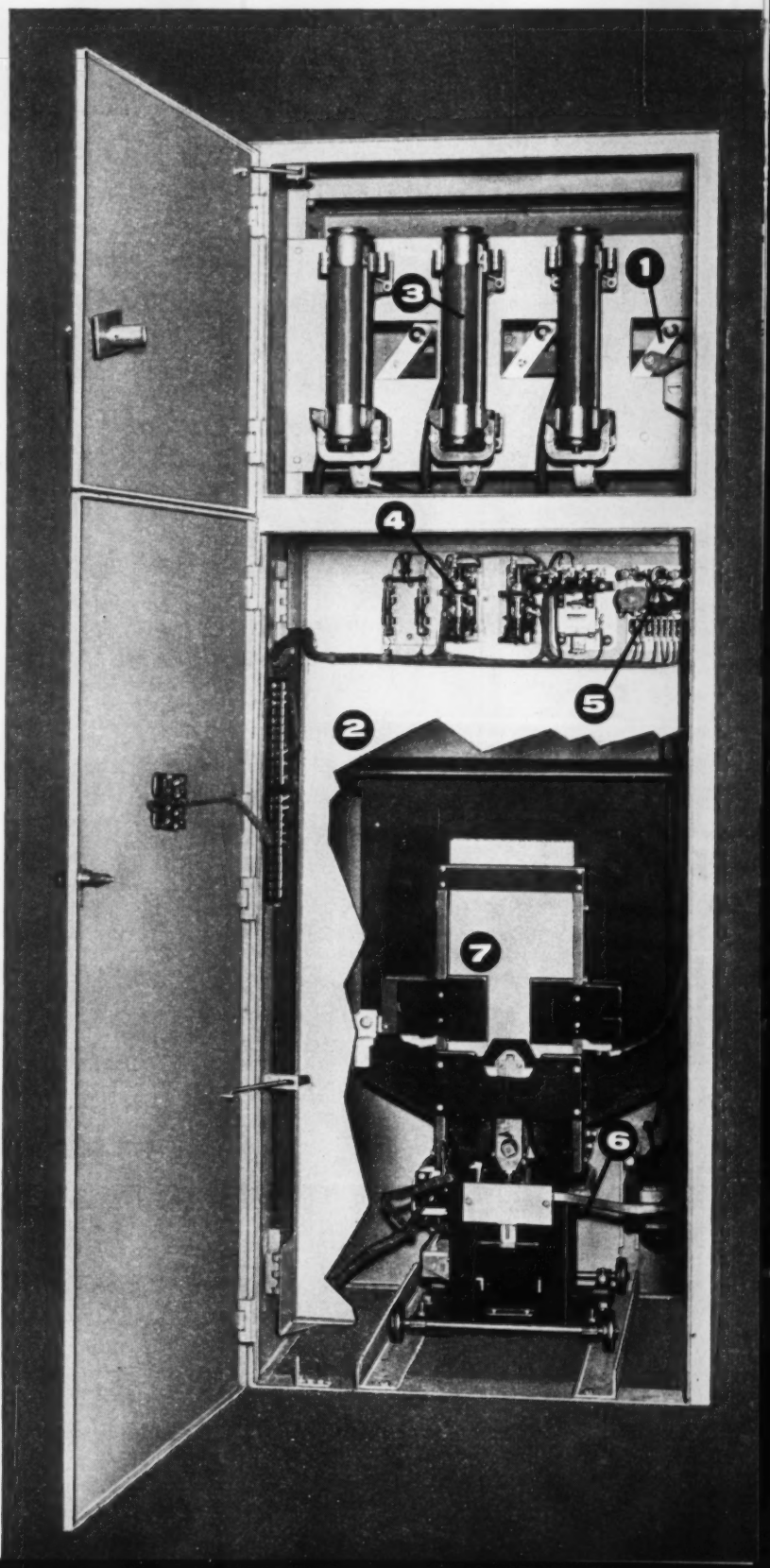
Undervoltage protection instantaneously opens line contactor on loss of voltage. Time-delay undervoltage protection also available.

6

Mechanical interlock coordinates contactor, disconnect switch, upper door and inner control barrier for maximum safety.

7

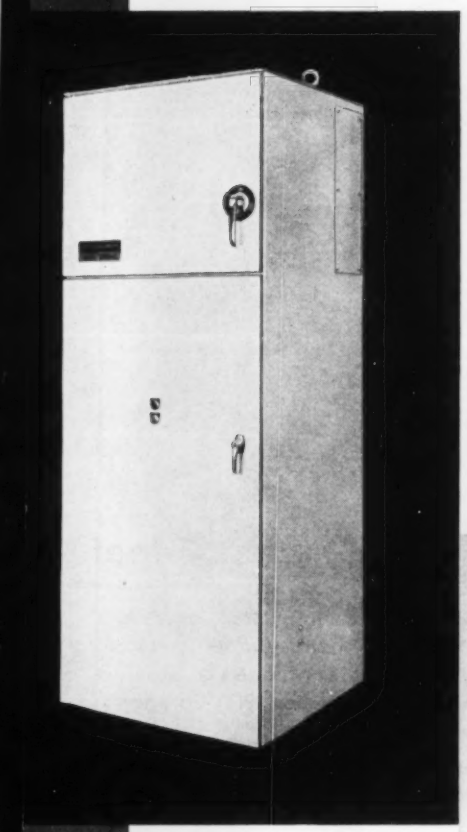
Roll-out contactor makes maintenance easy—even in narrowest aisle space. (Routine inspection and maintenance can be done with contactor in place.)



Designed

Type H High Voltage Motor Control

Combines front access with space economy...

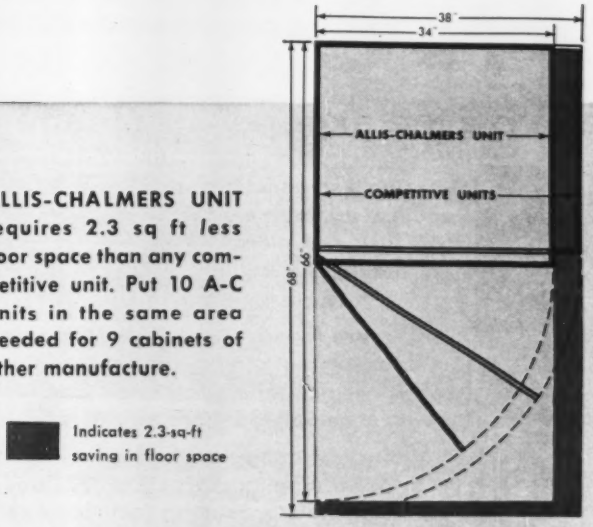


In addition, you get maximum protection for personnel and machines, thoroughly tested components, and ample panel space for modifications. It's all built into the *smaller cabinet* of a newly designed line of Type H high voltage starters from Allis-Chalmers.

Here is control that couples compactness with roominess (for ease of maintenance) . . . here is a starter that joins test-proven performance with versatility (for addition of meters and relays) — AND the line meets every 2300 to 5000-volt motor need.

For more information on this engineering advance, contact your A-C representative or write Allis-Chalmers, General Products Division, Milwaukee 1, Wisconsin.

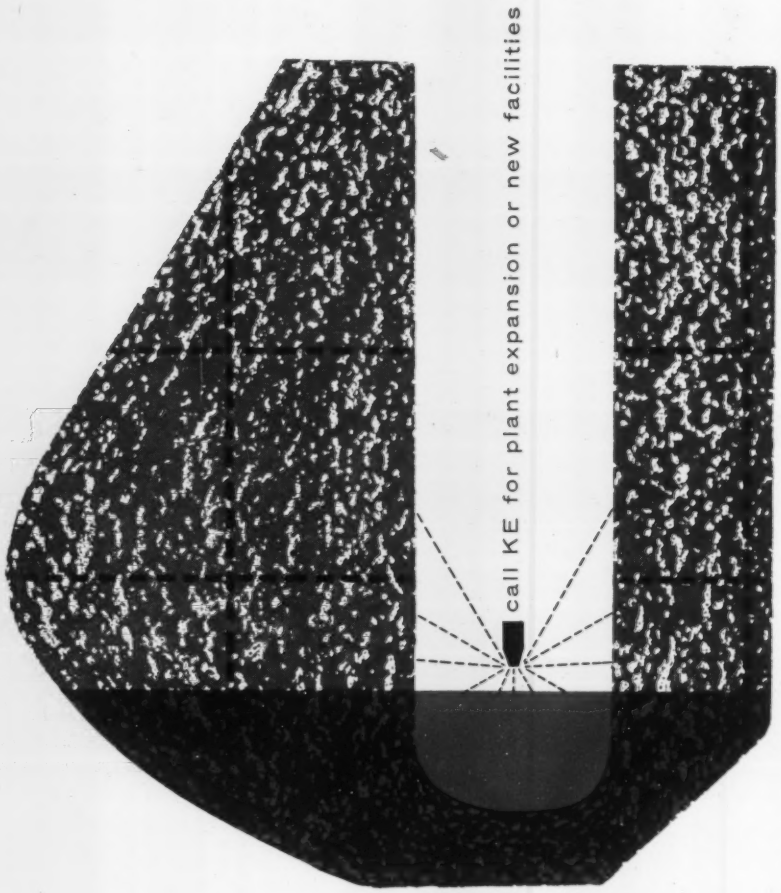
ALLIS-CHALMERS UNIT requires 2.3 sq ft less floor space than any competitive unit. Put 10 A-C units in the same area needed for 9 cabinets of other manufacture.



Indicates 2.3-sq-ft saving in floor space

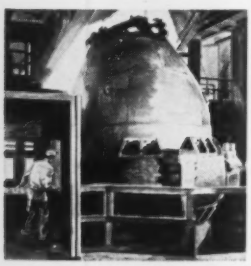
ALLIS-CHALMERS

A-5517



INGENUITY

has made KE the experienced leader in L-D Process Steel



L-D process plant similar to that now being installed by KE at a major eastern steel plant.

Design and construction of over 2,000,000 tons of oxygen steel making capacity. Intimate familiarity with oxygen steel technology in all parts of the world. A pioneer's experience in applying tested techniques of steel making. U.S. licensor for the proven L-D process—also P.T. Oxygen Guns for present and planned open hearths.

These are reasons why Kaiser Engineers is uniquely qualified to develop your oxygen steel program. Another reason is traditional KE ingenuity—engineering and construction ingenuity which means your steel facilities will be completed more quickly, at lower cost, and operate more efficiently.

Economic analysis, plant location, engineering, design, procurement, expediting, construction—KE does one or all. With your first thought of new steel producing facilities—call KE.

KAISER ENGINEERS engineers—contractors

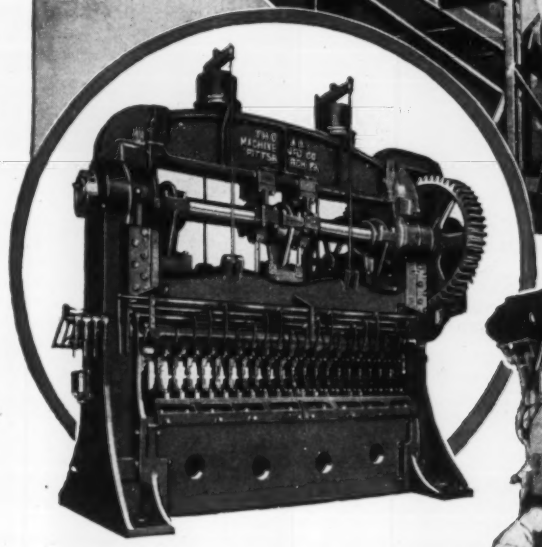
Contracting since 1914

Division of Henry J. Kaiser Company • Oakland 12, California • New York, Pittsburgh, Washington, D.C., Buenos Aires, Calcutta, Dusseldorf, Montreal, Sydney, Tokyo

4382

AS IN THE PAST HALF CENTURY

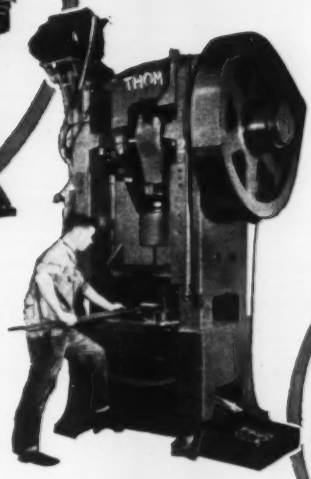
the trend is to Thomas for '57



ABOVE — Modern Thomas power-driven Spacing Machine especially developed for the "short run" shop

EXTREME LEFT—Thomas 1,000-ton Multiple Punch built for railroad car shop

BELOW—This Thomas double-angle shears combines advanced design with typical Thomas dependability



ABOVE — Single-crank straight-side press, one of many Thomas models

For over 50 years Thomas has served the steel industry with equipment designed to increase output and decrease operating costs. Make sure the equipment you buy meets the needs of today...specify THOMAS.

THOMAS
MACHINE MANUFACTURING CO.
PITTSBURGH 23, PA.

Tighter Coils For Better Springs

Co-owners Walter Pesaresi (left) and James Berg of Winamac Coil Spring examine coil of Pittsburgh Steel Oil Tempered Wire and a stock of coiled springs, ready for shipment.

Pittsburgh Steel's O. T. Wire Does Job For Winamac Coil Spring

When a spring-coiling job comes along so tough that many spring-makers dodge it, a satisfactory spring usually depends on combining human know-how with the right kind of quality steel wire.

A balance spring that supports the mower on a farm mowing machine presented such a problem recently to the Winamac Coil Spring Company in Winamac, Ind.

This is the story of how one man's knowledge of wire and spring-making produced a more than satisfactory spring on a difficult job.

The $16\frac{9}{16}$ inch long spring, coiled exceptionally tight and made of Pittsburgh Steel Company's Oil Tempered Wire, has 30 coils. Two and one-half coils at each end are passive. They hold a plug inserted by the farm implement manufacturer who buys the springs which support the weight of the mower on the tractor.

Springs often were rejected because of improper initial tension and burrs which interfered with insertion of plug ends.

Walter Pesaresi, co-owner and co-founder of Winamac Coil Spring Co. and a spring-maker all his life, credits three factors for his success in coiling the springs properly.

1. Selection of Pittsburgh Steel's Oil Tempered Wire.

2. Development of a new device which permitted tighter coiling.

3. Proper heat-treating techniques for stress-relieving the steel after coiling.

• **The Right Wire**—"Pittsburgh Steel's Oil Tempered Wire was a happy choice," said Mr. Pesaresi. "Its grain structure is right, it has a good surface, it's free from hard or soft spots and we can depend on it to hold uniformly to tensile strength specs."

• **Coiling Techniques**—Although Winamac Coil Spring has a hand-coiler matched by only three or four others in the country, Mr. Pesaresi found special techniques were needed to produce the balance spring with tight enough coils. To solve that problem, he designed and built a carriage and rollers that ride along the frame of the machine and guide wire on the mandrel. This device forces the wire being coiled tight against the wire just coiled. Exceptionally tight coils result.

• **Heat Treatment**—Coiling 21 feet

(Advertisement)

Balance spring is coiled on hand machine. It is equipped with a special carriage, designed and made at Winamac Coil Spring, which assures tight coiling.

Winamac uses other Pittsburgh wire than oil tempered. Here are tiny springs, made from music wire, for use in valves of Air Force oxygen masks.

Co-owner Walter Pesaresi examines finished balance spring, complete with plug which is inserted by customer who uses spring to support farm mower on tractor.

of .531 oil tempered wire into a 30-coil spring $16\frac{9}{16}$ inches long produces heavy stress in the wire.

That's why stress-relieving is necessary to impart exactly the proper physical characteristics.

In the mowing machine spring, stress relief is especially important. The spring is subjected to continuous flexing and must be capable of supporting widely varying shock loads throughout its full range of adjustments.

After study and experimentation, Mr. Pesaresi found stress relieving coiled springs for $2\frac{1}{2}$ hours at 500 degrees Fahrenheit provided just the right combination of time and temperature to give the springs long life in service.

• **Dependability**—Winamac Coil Spring has come to depend on Pittsburgh Steel for more than oil tempered wire.

Winamac uses music wire, supplied by the Johnson Steel & Wire Company subsidiary in Worcester, Mass., for automotive springs, appliance applications and for such uses as a valve spring for an Air Force oxygen mask. (Photo at left.)

"We found from actual experience," said Mr. Pesaresi, "that Johnson music wire was the only wire that held its dimensions uniformly."

Whether your operations call for oil tempered wire, some other type of manufacturers wire, or a fine wire specialty like Johnson's music wire, you'll find what you want at Pittsburgh Steel.

The fine, consistent quality of Pittsburgh wire holds down your production costs and builds customer satisfaction.

Trained Pittsburgh Steel engineers are readily available with counsel and wire know-how that will help solve your problems. You can get that help today by calling any of the Pittsburgh Steel district offices listed below.

Pittsburgh Steel Company

Grant Building • Pittsburgh 30, Pa.

District Sales Offices

Atlanta	Cleveland	Dayton	Los Angeles	Pittsburgh
Chicago	Dallas	Detroit	New York	Tulsa
		Houston	Philadelphia	Warren, Ohio

(Advertisement)

Can specialized business publication advertising actually sell?

By reputation, salesmen are reluctant to credit anything but their own selling efforts for getting names on the dotted line.

Actually, it's quite a different story. The most successful salesmen will tell you two important things about selling. 1. That the selling process is largely a matter of communicating ideas. 2. And that specialized business publication advertising can help importantly to register information with prospects.

Of course each salesman will express this in his own way . . . but they all agree that selling would be far more difficult without the advertising that appears in the industrial, trade and professional publications that serve the specialized markets to which they sell.

Here, for instance, is what a salesman has to say about this kind of advertising:

Fred Snyder, Cleveland District
Worthington Corporation

sells to industry

Says Mr. Snyder:

"We have, of course, sales leads from our business paper advertising that are forwarded to us on a monthly basis. But also the trade advertising has its impact on many who do not at the time request specific information. Worthington is far better known today than it was five years ago, due in no small measure to the aggressiveness of its advertising and sales promotion department.

"Their work makes my job easier. First of all, we have an entree in companies where some Worthington products were not previously as well-known as our original line. We're getting a lot better sales coverage on all products. The Corporation manufactures so many products today that even regular customers may be unfamiliar with some of these products. Through trade advertising and sales promotion we have been able to sell the whole Worthington line.

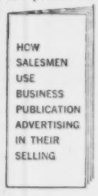
"Getting back to sales leads—they are particularly helpful to our dealers. In Cleveland, W. M. Patterson Supply will undoubtedly receive inquiries from Worthington's advertising. Scott-Tarbell, Inc., Cleveland Oak Belting, or other dealers handling special product lines will pick up leads from our advertising to help them get business.

"I think we've grown eightfold since the war. This year we hit two hundred million. It used to be that twenty-five million was a good year. The advertising and sales promotion department has aggressively been attacking their part of the problem within the last five years. Prior to that the name Worthington was not nearly so well-known and we put much less emphasis on advertising."

Ask your own salesmen what your company's business publication advertising does for them. If their answers are generally favorable you can be sure that your business publication advertising is really helping them sell. If too many answers are negative it could well pay you to review your advertising objectives—and to make sure the publications that carry your advertising are read by the men who must be sold.

How salesmen use their companies' advertising to get more business

Here's a useful and effective package of ideas for the sales manager, advertising manager or agency man who would like to get more horsepower out of his advertising. Send for a free copy of the pocket size booklet entitled, "How Salesmen Use Advertising in Their Selling," which reports the successful methods employed by eleven salesmen who tell how they get more value out of their companies' advertising.



You'll find represented many interesting variations in how they do this. Some are very ingenious; all are effective. You can be sure that more of your salesmen will use your advertising after they read how others get business through these simple methods.

The coupon is for your convenience in sending for your free copy. Then, if you decide you want to provide your salesmen with additional copies, they are available from NBP Headquarters in Washington, at twenty-five cents each. Or, if you choose you can reprint the material yourself and distribute it as widely as you please. But first, send for your free copy.

NATIONAL BUSINESS PUBLICATIONS, INC.
Department 2E
1413 K Street, N. W.
Washington 5, D. C. STerling 3-7533

Please send me a free copy of the NBP booklet "How Salesmen Use Advertising in Their Selling."

Name _____

Title _____

Company _____

Street Address _____

City _____ Zone _____ State _____

National Business Publications, Inc.

NBP

. . . each of which serves a specialized market in a specific industry, trade or profession.

Buying stainless steel plate from Jessop is like owning your own mill

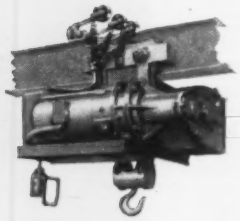
When you order from Jessop you don't wait in line. Jessop operates a compact, highly adaptable stainless plate department—all under one roof from melting to finishing. Production schedules can be adjusted overnight to suit your need. Moreover, with the 3rd largest stainless plate mill in the country now in operation, sizes are available up to 80″ in width and 240″ in length. And Jessop's years-ahead chemical control equipment quickly identifies tramp elements in the molten bath—permits their removal so you will enjoy improved forming and welding characteristics in the finished plate. You'll find it will pay to send your next inquiry to Jessop where doing business is like owning your own mill.

JESSOP DELIVERED

STEEL COMPANY · WASHINGTON, PA.

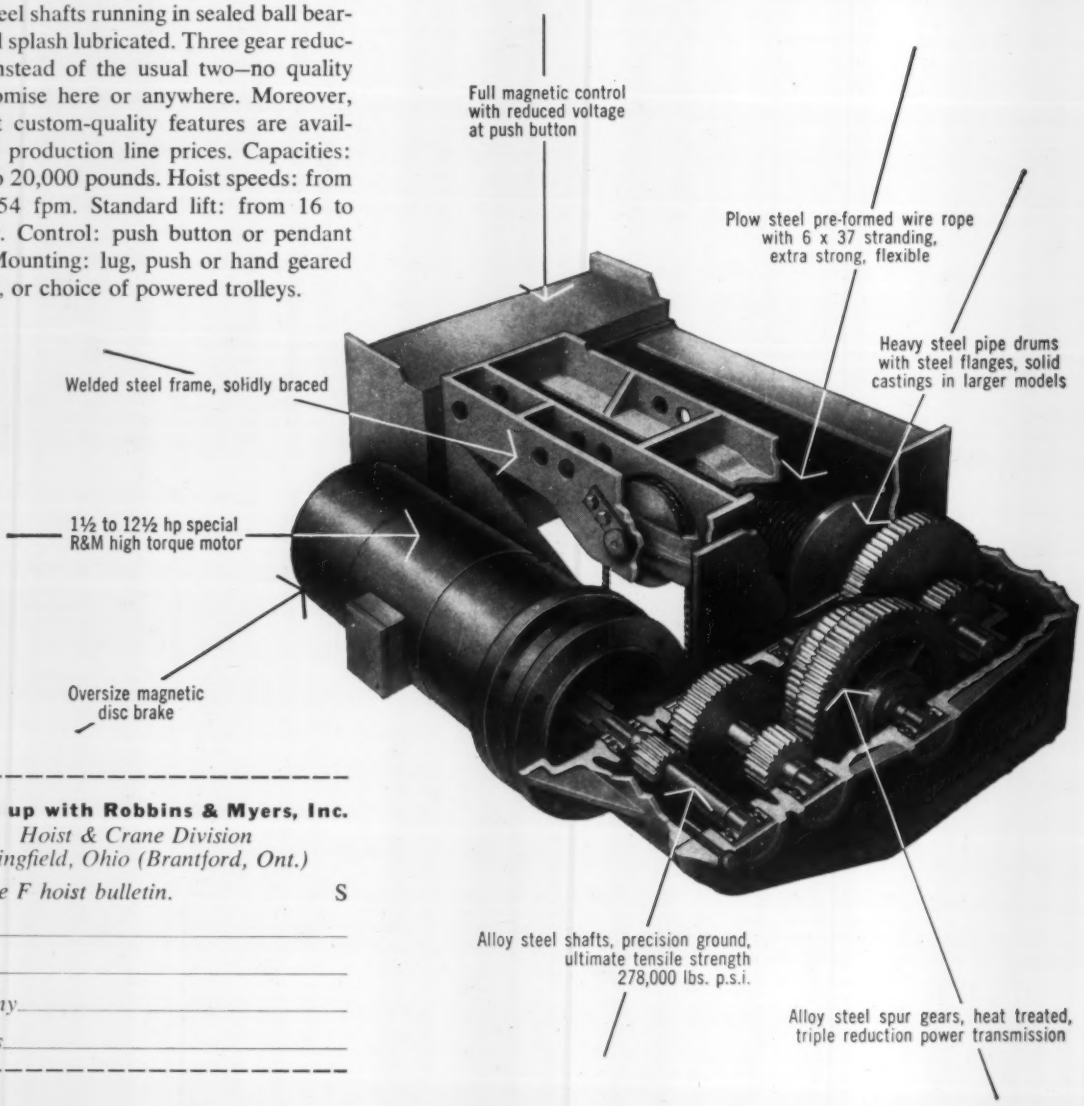
OFFICES IN PRINCIPAL CITIES

Wholly-owned Subsidiaries: Jessop Steel of Canada Limited, Wallaceburg, Toronto
Jessop Steel International Corp., Chrysler Building, New York, New York
Green River Steel Corporation, Owensboro, Kentucky



R&M F hoists cut down the cost of lifting but the F hoists save still more money. Dollars usually spent on maintenance become dollars earned because of the extra stamina built into each component. Look at the gearing—here are precision cut alloy steel spur gears, wide faced and heat treated for durability. They're mounted on alloy steel shafts running in sealed ball bearings, all splash lubricated. Three gear reductions instead of the usual two—no quality compromise here or anywhere. Moreover, F hoist custom-quality features are available at production line prices. Capacities: 1000 to 20,000 pounds. Hoist speeds: from 10 to 54 fpm. Standard lift: from 16 to 40 feet. Control: push button or pendant rope. Mounting: lug, push or hand geared trolleys, or choice of powered trolleys.

choose a hoist with extra stamina


Full magnetic control with reduced voltage at push button
Plow steel pre-formed wire rope with 6 x 37 stranding, extra strong, flexible
Heavy steel pipe drums with steel flanges, solid castings in larger models
Welded steel frame, solidly braced
1½ to 12½ hp special R&M high torque motor
Oversize magnetic disc brake
Alloy steel shafts, precision ground, ultimate tensile strength 278,000 lbs. p.s.i.
Alloy steel spur gears, heat treated, triple reduction power transmission

take it up with Robbins & Myers, Inc.
Hoist & Crane Division
Springfield, Ohio (Brantford, Ont.)

Send me F hoist bulletin. S

*Name*_____

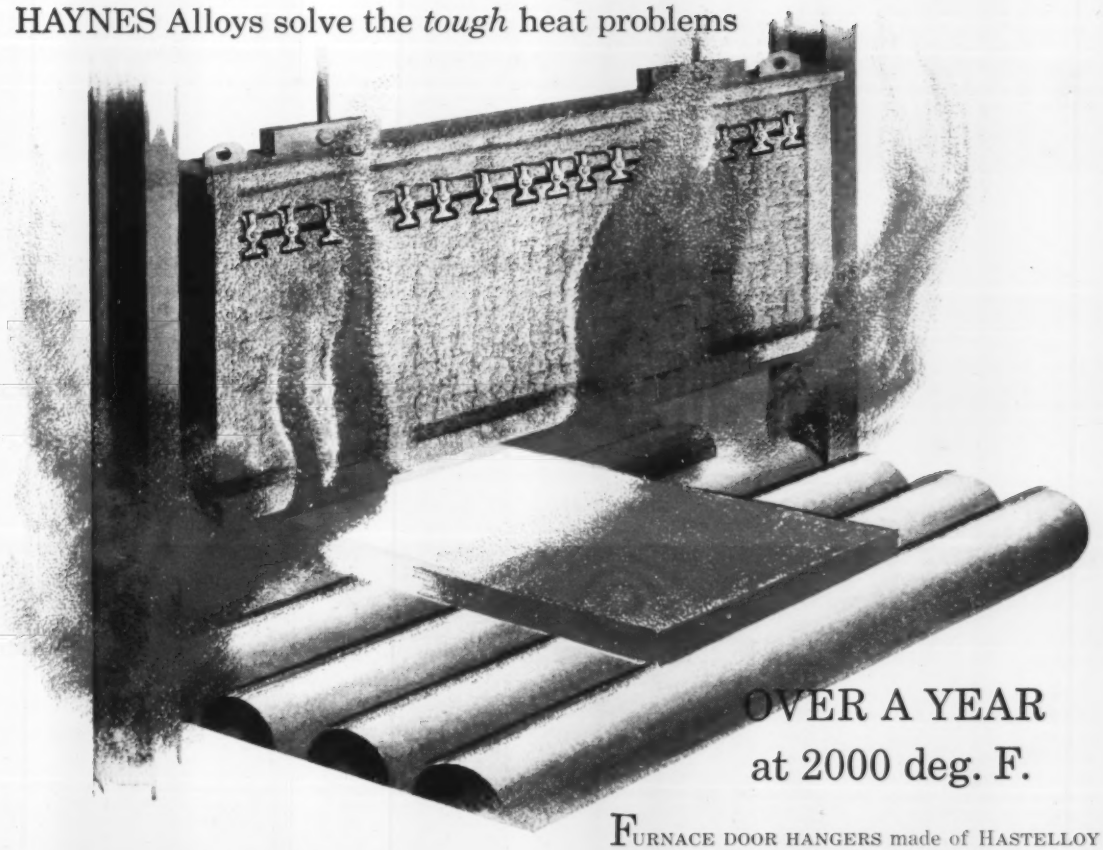
*Title*_____

*Company*_____

*Address*_____

ROBBINS & MYERS **hoists • cranes • winches**

HAYNES Alloys solve the *tough* heat problems



OVER A YEAR at 2000 deg. F.

FURNACE DOOR HANGERS made of HASTELLOY alloy X are nearing completion of their second year of service, where ordinary hangers failed in three to four weeks. They support the interlocking firebrick of the doors and are exposed to the direct impingement from the 2150 deg. F. furnace flame and reducing or oxidizing atmospheres.

This is another example how HAYNES alloys serve the metalworking industries . . . by providing parts that are strong at high temperature. If you have a maintenance or production problem involving temperatures in the 1000 to 2100 deg. F. range, contact HAYNES STELLITE COMPANY, Division of Union Carbide Corporation, General Offices and Works, Kokomo, Indiana. Sales Offices in Chicago, Cleveland, Detroit, Houston, Los Angeles, New York and San Francisco.

Hangers must maintain firm grip . . . to prevent fire-brick from crumbling. After 5 weeks of operation here's what happened to the hangers—the four on the left are made of HASTELLOY alloy X, the others are not.

HAYNES ALLOYS

HAYNES STELLITE COMPANY

Division of Union Carbide Corporation

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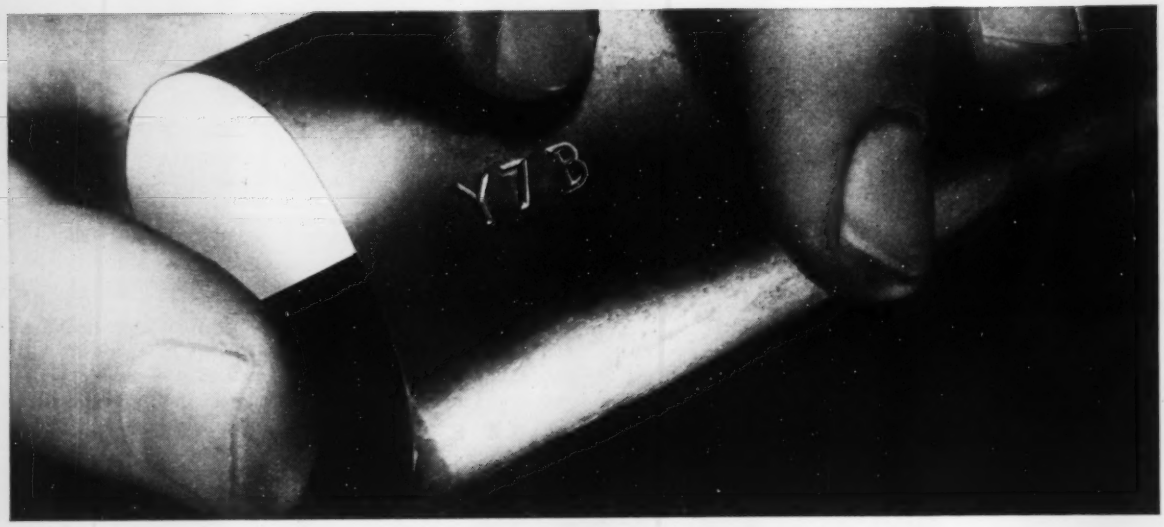

Alloys from different furnace heats can vary in hardenability and other working characteristics. But with Ryerson alloys you *know* the differences—before you start production. Ryerson alloys are marked with symbols identifying them with the particular heat from which they were rolled. As a Ryerson *extra* you get a dependable special report showing:

1. **Heat analysis.** Not just the chemical range for the type of alloy, but the specific analysis of the heat from which your steel was rolled.
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For more information about Ryerson alloys and the Ryerson Certified Alloy Steel plan, call your nearby Ryerson plant.

Principal products: Carbon, alloy and stainless steel—bars, structurals, plates, sheets, tubing, industrial plastics, machinery and tools, etc.

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DETROIT • PITTSBURGH • BUFFALO • INDIANAPOLIS • CHICAGO • MILWAUKEE • ST. LOUIS • LOS ANGELES • SAN FRANCISCO • SPOKANE • SEATTLE

Next Round in Bethlehem Merger Case

Hearings on the arguments in the Bethlehem-Youngstown merger case are scheduled to begin today (Nov. 4). The government seeks, and the two steel companies oppose, a summary judgment barring the proposed merger. Judge Edward Weinfeld (U. S. District Court, Southern District of New York) may decide by about December. If the U. S. wins, the matter will be taken to the Supreme Court by the defense, a move which would delay a decision at least another year. If the steel firms win, a full trial, before Judge Weinfeld, will result. Final disposition could extend beyond 1958.

Experiment in Indiana

Take a look at the steel industry's plan to get around Indiana's law that prohibits state jobless pay to workers receiving Supplemental Unemployment Benefits (SUB). Under the plan, a worker in Indiana without dependents and earning $2.725 an hour can draw $58 a week in SUB alone, compared with $25 a week in SUB and $35 a week in state payments for a worker in Pennsylvania which has no anti-SUB law. In Indiana, that arrangement can last until excess in payments over the normal maximum (to employees in states like Pennsylvania) reaches 2 per cent of a company's SUB accumulation in all states. Then an alternate method starts: The worker draws state aid of $33 weekly for three weeks, then an SUB payment of $133 for the fourth week. The Pennsylvania setup of $60 weekly in state and SUB payments lasts for 30 weeks; then state payments stop and an SUB payment of $47.50 weekly lasts for 22 weeks. In Ohio, the other major problem state, a court ruling is sought to permit conventional SUB operation.

Labor Looks to 1958 for New Laws

The AFL-CIO wants these programs passed next year by Congress: Minimum wage of $1.25 an hour, federal aid for school construction, financial disclosure of welfare and pension plans, tax cut for middle and low income groups, depressed area legislation, a federal dam at Hells Canyon, a housing program resulting in 2 million starts a year, improved civil rights legislation. Except for the welfare disclosure bill, the programs have little chance of passage.

Investments in Missiles

Air Materiel Command reports that industry has put up $1 for every $2 invested by the government for facilities to produce the Atlas, Titan, and Thor. Most of the aircraft industry's money has been used for seven new plants. Air Force funds were used for machine tools and related

production equipment, for laboratory and test apparatus, and for test stands near contractors' plants.

Mobile Plant for Liquid Oxygen

Air Products Inc. has built a mobile liquid oxygen plant to provide fuel for the Army Redstone missile. The facility will produce 20 tons per day and is mounted on four truck-drawn trailers.

The Committee Way of Life

Committees are becoming a way of corporate life, according to an American Management Association survey. Two-thirds of the respondents report their companies have more committees today than they did five years ago. Eighty-nine per cent of the respondents say their committees exchange views and information. Other functions listed: Make recommendations, generate ideas, make major decisions. Committees also have more power today, the survey reveals. One-fifth of the respondents want more authority for committees. Three-fourths think they have enough now.

Pittsburgh-Erie Canal?

The Pennsylvania State Planning Board has revived an idea for a $100 million Pittsburgh-Erie canal, to tie in with the St. Lawrence Seaway. First advanced in George Washington's day, the proposal would open a new water route for western Pennsylvania—down the Ohio and Mississippi Rivers to New Orleans. A New York engineering firm is studying routes, updating an Army study on the canal made during World War II.

Straws in the Wind

U. S. Steel Corp.'s order backlog on Sept. 30 was 6.4 million tons, compared with 6.9 million on June 30 and 8.1 million on Sept. 30, 1956 . . . Salary levels of engineering, scientific, and administrative employees in industry rose an average of 5.9 per cent between June, 1956, and June, 1957, says the American Management Association . . . Union membership now totals 18.5 million.

Air Power Notes of the Week

The Air Force says a choice will soon be made between Boeing and North American as the airframe contractors for Project WS-110, the long range, supersonic bomber for the Strategic Air Command. A chemically fueled bomber with six engines (reportedly to be built by General Electric), it would replace the B-52 . . . An Army general was ordered to delete from a speech: "Interceptor aircraft are obsolete; usefulness of bomber aircraft will fade. The Nike-Ajax can kill any bomber that flies; the Nike-Hercules, whole formations of planes" . . . Air Materiel Command says: "We have nearly exhausted our bag of manufacturing tricks and must overcome the knowhow barrier to build air weapons capable of speeds in excess of Mach 20."

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The Complete Marvel Line of Hack Saws and Band Saws Operating!

...available for demonstration or testing on your own material!

How would you like to run sawing tests on your own material... watch demonstrations under actual working conditions, of the world's most modern hack saws and band saws—and compare, if you wish, band sawing and hack sawing to see which type of saw is best for you?

You are cordially invited to come in to see and make use of the Sawing Demonstration Room—the most complete and up-to-date facility of its type in the country. Staffed by experienced metal sawing engineers and technicians, the Sawing Demonstration Room has been set up for your convenience. We sincerely believe you will find it interesting and helpful in your selection of metal sawing equipment.

Here, you will see the most modern single cut and automatic bar feed hack saws and band saws (including the *all new* MARVEL No. 81 and 81A Universal Hydraulic Band Saws equipped with the amazing "TRUE-LINE" Automatic Blade Control (Basic Patent Applied For) and using High Speed Steel Band Saw Blades.)

If you have any type of sawing problem, or if you would just like to come in and see a demonstration of the fine cutting MARVEL Saws can do, the Demonstration Room is always open to you.

MARVEL Metal Cutting SAWS
Better Machines-Better Blades

ARMSTRONG-BLUM MFG. CO.
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Relieves traffic congestion. To handle the ten million cars a year which now funnel onto the 3-lane Carquinez Bridge, (right) the State of California is building this second bridge connecting the San Francisco Bay area and the Sacramento Valley. Use of nickel-containing USS "T-1" Steel in critical truss members has simplified design...reduced unnecessary weight...saved money.

A tale of two bridges ...and an $800,000 saving

Twins? *Almost.*

But there are two differences. The span on the right is 30 years old. Her sister is brand new.

Another big difference is in their construction materials. The most highly stressed truss members of the new bridge are USS "T-1" Steel . . . a high yield strength constructional alloy steel containing nickel.

"T-1"®, produced by United States Steel Corporation, has nearly three times the yield strength of structural carbon steel. It is at least four times as resistant to atmospheric corrosion. And it can be welded with relative ease.

It reduces weight and simplifies design.

According to computations by the State of California, "T-1" Steel will save approximately $800,000 in construction costs.

Are *you* looking *for* weight saving . . . added corrosion resistance . . . dependable strength? A nickel alloyed steel may be just what's needed to improve whatever you're making or building. Let us help you find out. Here at Inco, you can get counsel and data based on years of specialized experience with alloys containing nickel.

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NICKEL ALLOYS PERFORM BETTER, LONGER

Don't Run for the Hills!

Mark Twain once said that pessimism is the wisdom of men with weak nerves.

His observation reminds us of the apprehension being expressed by a good many men in business. They are unduly disturbed by fluctuating stock prices, the launching of sputnik, declining orders, and shrinking profits.

Their thinking runs something like this: "Business is bad and probably will get worse. Let's run for the hills and wait and see what happens."

Businessmen with stronger nerves take the leveling off more philosophically (see Page 65). They say: "Now that business is only wonderful, a lot of people are all steamed up because it is not spectacular. Organizations doing twice as much business as they did a couple of years ago are upset because they had forecast they would do two and a half times as much. We have been spoiled."

We can readily sympathize with a run-for-the-hills complex but not condone it. For most companies, sales and profits have been curving upward for one, perhaps two, decades. Sales came easily. Salesmen lost the art of selling and simply became order takers. With a rapidly growing population and ever-higher standards of living, it was felt there could be no course but upward.

Such thinking triggered a lot of expansion. It, in turn, brought about the situation we face now: Momentarily, the nation's productive capacity is greater than its ability to consume.

We agree with those who take the philosophical view. With all the facts in proper perspective, they are convinced that less than capacity operations and smaller new order books need not be disturbing. The growth factor in the economy is still present.

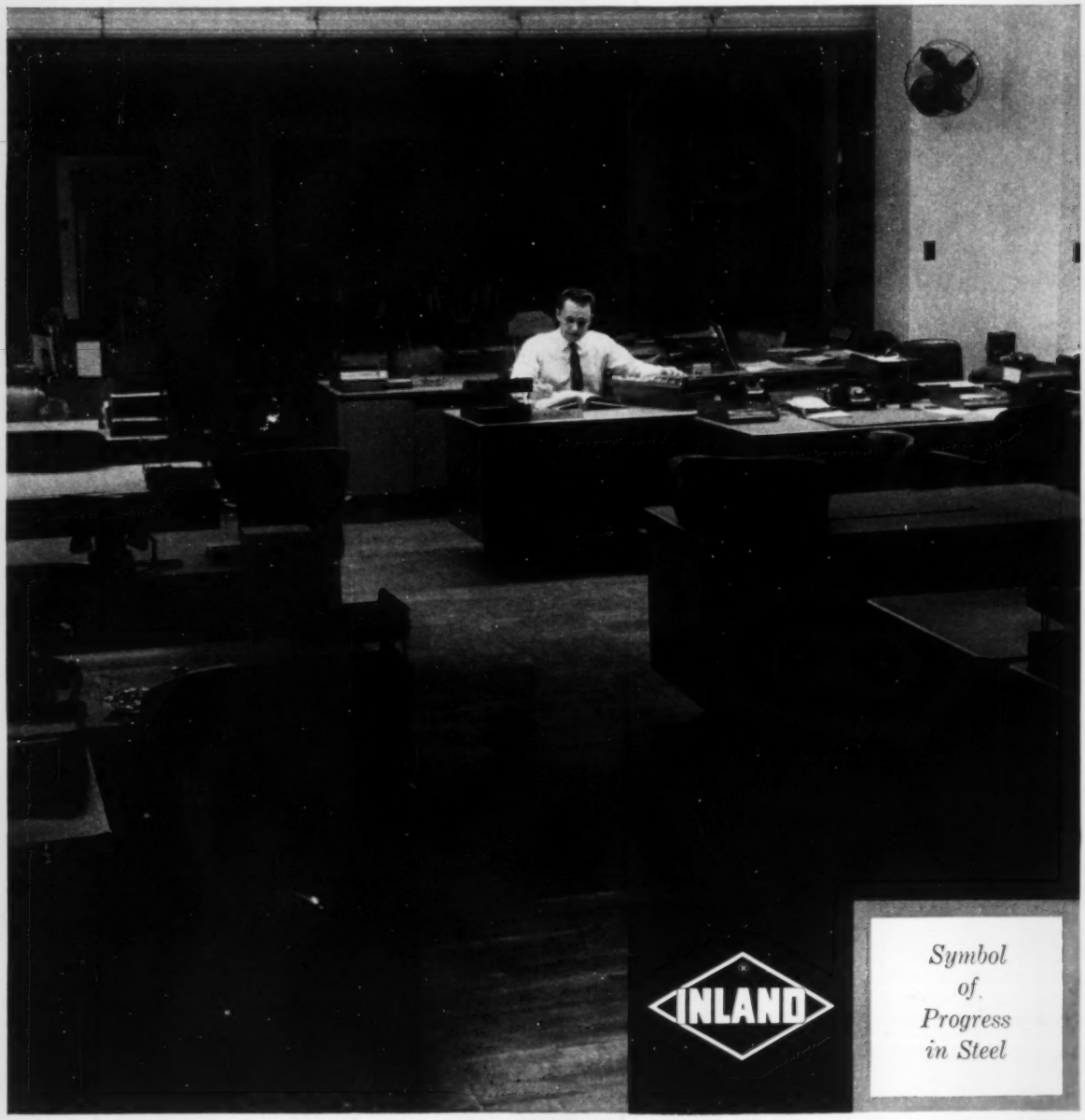
As we see it, the problem is to avoid standing still or retrenching at a time like this. We must recognize the plateau for what it is and keep right on building for the future. We must keep pace with the flood of new production processes, new equipment, new products, and new marketing methods resulting from our research and development programs.

To those who have fears for the future we offer another remark attributed to Mark Twain: Of all my troubles, the worst have never happened.

Irwin H. Such
EDITOR-IN-CHIEF

20 more on the 76

Making steel is not the only after hours operation at Inland. Scheduling production to make certain you get the *kind* of steel you need, in the *quantity* you need, and *when* you need it is another job that can't be put off until tomorrow. Production schedulers are in constant touch with every mill, aware of up-to-the-minute operating capabilities, keeping steelmakers informed of changing requirements . . . like squeezing an extra 20 tons into a mill schedule for a customer with a last minute "must." As nerve center of the sales department, Inland's order division is close to the mills and close to the customer . . . ever sensitive to his requirements.



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Components Show Slow Upswing in Fourth Quarter

Timken Roller Bearing Co.

Diecastings—Automotive business is behind the fourth quarter pickup. Total tonnage in 1957 will rise, but dollar value will dip.

Electrical Equipment & Motors—Fourth quarter will be about equal to last year's corresponding period.

Fasteners—Upturn is developing slowly, but the quarter will be better than last. Strength will carry over into 1958.

Ferrous Castings—Gray iron, malleable, and steel castings are all in a downtrend. Reductions in the workweek and labor force are common.

Forgings—Poor third quarter made better fourth inevitable. Aircraft cutbacks have hurt some companies.

Gears—Fourth quarter orders are holding at about the level of the rest of the year. Present volume is "comfortable."

Nonferrous Castings—Activity has increased slightly, but reductions in the workweek and labor force are common.

Screw Machine Products—Orders and shipments are behind 1956 pace; and upturn this quarter will be too small to close the gap.

Springs—There has been no significant upturn so far despite better sales to the farm equipment and electronics industries.

Stampings—Ups and downs about evenly divided, leaving the over-all position in fourth quarter at previous level, which was good.

Wire Shapes—New orders are increasing by 10 to 15 per cent in the fourth quarter, with a continuation into 1958 a strong possibility.

Makers Mildly Optimistic

"NOW THAT business is only wonderful, a lot of people are steamed up because it isn't spectacular."

That's how one producer of electric motors views business today. The majority of component makers contacted by STEEL agree with him and see a mild upturn for partmaking in the fourth quarter. But a substantial minority are still pessimistic. A common point made by optimists and pessimists: "We're captives of the industries we serve; no amount of 'sell' will persuade the machine tool builder to make more tools or the automaker to assemble more cars."

Here are the common reasons for predicting an upturn or downturn:

Upturn—Many partmakers say the third quarter was so low that the only way they have to go this period is up. For some, the upturn would have to be terrific to wipe out the losses of the preceding quarter. Most of those reporting a significant improvement are tied to the auto industry, which turns up at this time of the year regardless of ultimate sales. Others say the pattern is accounted for by renewed buying after vacation periods. Pre-Christmas production accounts for the uplift for others.

Downturn—Suppliers tied to the capital goods industries are feeling

the effects of the leveling off reported two weeks ago in STEEL (Oct. 21, Page 42). Cutbacks in the government's aircraft program are being felt particularly by the forging industry. A continuation of inventory reduction is generally slowing things up, accompanied by the wait-and-see attitude of many end-product manufacturers. Tight money has little direct effect on many suppliers, but it has slowed down some of their customers.

The industry-by-industry breakdown:

Diecastings—The auto industry has been responsible for most of the fourth quarter increase, although appliance makers have helped out. Zinc is holding its own this year, and aluminum will show a 4.9 per cent gain over the record tonnage in 1956. Brass diecasters report no upturn, but some believe this could be a near-record year. Magnesium castings will miss out on a record because of cutbacks in airplane building.

Industry dollar volume will be down because of price drops in major nonferrous metals this year. Despite rising labor costs, one foundry says it is reducing costs: A part it is making for 42 cents cost 50 cents last year.

Electrical Equipment, Motors—Orders are about the same as they were a year ago—which is good. But no definite upturn is evident. One manufacturer says: "I know organizations that are doing twice as much business today as they did two years ago, but because they had forecast they would do two and a half times as much, they are disappointed. We have been spoiled."

Fasteners — The fourth quarter is developing a little slower than expected, but autos and appliances are providing some punch. Some customers, such as the railroads, had more inventory than anticipated, but they are beginning to order again. Dollar volume this year will be a little ahead of last year's, but physical volume will fall shy by a small percentage.

Ferrous Castings — Of all the components considered in this survey, ferrous castings are probably the worst off. Orders from railroads, which account for about 40 per cent of steel founders' business, are dropping off as the backlog of freight cars declines. Shipments for 1957 will be off the 1956 pace by 10 to 15 per cent, but this will still be a good year. Dollar value will be about equal to last year's because of increased prices.

Gray iron founders see no upturn in the near future. Many are working only 20 or 30 hour weeks, or are cutting their work force. The fourth quarter will probably be better than a poor third, but it will still be about 8 per cent below last year's period. An upturn should come in 1958's second half, but until then, the present level will hold.

Malleable casters talk optimistically of holding at the present level, mainly on the strength of auto orders. Any pickup expected because of this has been canceled out by reductions of 15 to 20 per cent in sales to other big customers.

Forgings—Most shops contacted report business is up in this quarter over last, but it's still not as good as it was in the first quarter. Those doing heavy business with the Air Force are hurting because of cutbacks. One Columbus, Ohio, firm says its orders have increased about 20 per cent since August, and inquiries are about 10 per cent above the year-ago level.

Gears—Gearmakers are a little disappointed with the failure of new orders to pick up in the last two months. However, the industry has not backed off from the high level it has maintained through most of 1957. Orders for special gearing continue high, but machine tool and standard gears are down.

Nonferrous Castings—Orders for permanent mold castings are equal to or better than they were a year ago, but sand casting orders are down significantly. The pattern of order placing is hand-to-mouth, with little inclination on the customer's part to commit himself far in advance.

Screw Machine Products—There has been some pickup over September business, but that month wasn't too good itself. The year so far is somewhat below 1956 in shipments and orders, and it doesn't look like the fourth quarter will change the picture. One maker claims he expects to repeat this year's volume next year and will still consider it good.

Springs—No significant upturn is reported, but producers anticipate it will come before the end of the quarter. There has been some firmness in sales to farm implement makers and the electronics industry, while appliance makers have been holding back. The number of small orders is increasing.

Stampings — About as many manufacturers report ups as downs in this industry, although many observers feel the potential for a real upswing is still present. Nevertheless, 1957 will be a pretty good year, according to H. A. Daschner, secretary of the Pressed Metals Institute. Next year should be slightly better.

Wire Shapes—The fourth quarter rise is definitely here for this industry, and it will carry over into 1958. Producers claim that when business in general is down and the emphasis is on cost cutting, their orders usually pick up. They claim it is often cheaper to use wire shapes than sheet metal parts. Orders have picked up as much as 20 per cent for some companies in this quarter.

To Produce Press Products

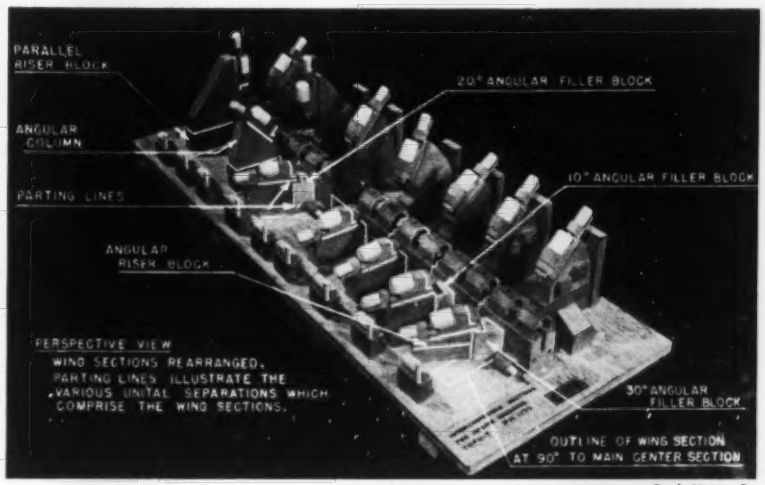
Pheoll Mfg. Co., Chicago, acquired a new plant in Michigan City, Ind., to produce press products. The 76,000 sq-ft building is on an 11½-acre tract. Noland McDonald is general manager.

Janitrol Starts Expansion

Surface Combustion Corp.'s Janitrol Aircraft Div. is spending $2 million for new buildings in Columbus, Ohio. All Janitrol operations will be at one location. Included in the new facility will be engineering and sales departments, as well as manufacturing, purchasing, and production control.

Of the 130,000 sq ft to be added, 90,000 will be for manufacturing, 20,000 for research, development, and testing, and 20,000 for offices and training and conference rooms.

Among products to be made will be aircraft heaters, heat exchangers, pneumatic regulators and valves.


PARALLEL RISER BLOCK
ANGULAR COLUMN
PARTING LINES
ANGULAR RISER BLOCK
20° ANGULAR FILLER BLOCK
10° ANGULAR FILLER BLOCK
30° ANGULAR FILLER BLOCK
PERSPECTIVE VIEW
WING SECTIONS REARRANGED. PARTING LINES ILLUSTRATE THE VARIOUS UNITAL SEPARATIONS WHICH COMPRISE THE WING SECTIONS.
OUTLINE OF WING SECTION AT 90° TO MAIN CENTER SECTION

Ford Motor Co.

White lines on this model show where standardized units can be detached from the in-line transfer machine. Bases, wing sections, and columns could be rearranged to make up an entirely new machine

Standardized Tools for U.S.?

Pentagon shows interest in Ford's building block concept. It may aid quick mobilization or production of missiles. Machine tool industry will be checked for opinions

WASHINGTON'S machine tool buyers and planners are taking a long look at high production equipment.

Most of those men recently sat behind closed doors in the Pentagon and heard representatives of Ford Motor Co. spell out their building block concept for machine versatility.

Why the Interest?—First, mass-production machines that can be quickly built up from standard components (Ford's plan) may cut the time it takes to start up defense production. Second, if the first stages of war knock out substantial parts of our production, we might be able to get on our feet fastest if could rebuild critical facilities with equipment and components that were spared.

A third possible reason is still speculative. The Air Force, a prime mover in these discussions, could be thinking in terms of current production for guided missiles.

Caution — Defense Department spokesmen say that no decisions will be made on Ford's concept until they find what machine tool builders think about it. STEEL has sampled that opinion (see Page 68).

The two men who did the talking for Ford at the Pentagon were D. C. Pippel, manager, mobilization planning and defense sales department, and H. C. Daum, manager, machining process department, manufacturing engineering office.

Impact—Mr. Pippel told what he thought the building block type of equipment could mean to defense when he said: "This concept is the most important innovation in the metalworking industries since the early developments in automation. I believe it could make obsolete all existing estimates of the nature and magnitude of America's potential for the production of defense materiel in an emergency."

Program—Mr. Pippel suggested the government could: Make precise plans for products needed on M-Day, adopt the building block concept for production of these products, design machine tool components needed for the job, build and stockpile these components.

Then, he explained, if war comes, the defense manufacturer: "Will be able to quickly convert his own tools and equipment to military production. And he will be able to draw on the government's stockpile of standard components and assemble the additional machines he needs."

Summary — Mr. Pippel rounded out his presentation with these words: "Recent estimates indicate that if a successful mass nuclear attack were made on this country by a ruthless enemy, casualties could reach fantastic totals.

"If such a conflict were to come about, the nation that is first able to stagger to its feet, rally its remaining resources, and put together some semblance of a production system will probably emerge victorious.

"And remember, that the key to the prompt restoration of production, so essential to our survival, may well be the concept which I have been exploring with you here today."

What Is It? — Mr. Pippel explains the building block concept as: "The application of standardization to the design and construction of automatic machine tools by incorporating interchangeable components into the structure of these machines."

Mr. Daum elaborates: "In in-line transfer machines built to this concept, matching surfaces for such major components as vertical and angular columns, wing bases, and main bases would be standardized dimensionally. Appropriate dimensional standards would be developed for each of the various horsepower ranges of drive units normally encountered."

Here are the dimensions Mr. Daum says are susceptible to standardization: Work height from the floor to the loading surfaces of the fixture, standard mounting patterns for bases and for machine components like vertical columns and power unit adapters.

Underway—As Mr. Daum point-

Builders Look at Building Blocks

WHEN government goes to industry for an opinion of the building-block concept, there'll be no fast endorsement or condemnation. Most builders see it as a relatively simple proposal with highly complex ramifications.

To sample industry thinking on this subect, STEEL talked with many builders. This report is based on their answers.

Yes and No—Many builders, notably those who have sold machines to Ford's new specifications, have no quarrel with standardization by the user. They see it as a good way to get standardization within a company and they understand the desire for the interchangeability. Such thinking presumably applies to the government writing its own specifications.

There is some objection when it's suggested that users (or worse, builders) get together to write a single standard for all to follow. In addition to the tough task of getting everyone to agree on one set of specifications, general standardization would infringe on the industry's brand of free enterprise.

Price is not the prime source of competition in machine tools. It's competition involving the ingenious machine design, technical feature, and production concept. Such competition has led to most of our production advances. Anything that smacks of standardized machine tool design will meet opposition. Some feel that any such a deterrent to new and better product development would limit their ability to sell in the replacement market, and that's their big target.

(Ford answers this way: "We're only talking about mounting dimensions, not component design.")

A few builders pointed out that, once started, the trend toward standardized machine components may be hard to stop. At the far end of the trend they see a possible environment in which a user can purchase standard components from any of a dozen competing builders and then assemble the machine himself. Builders would no longer serve as designers and innovators but would become suppliers of production line hardware. That's a role they don't want.

Here are two other questions that may be asked when the industry is queried: 1. What about the legality of builders getting together to agree on product features? 2. If government specifications are written, who will pay for redesign, new patterns, molds, jigs, fixtures, and other modifications needed to conform to the new specifications?

ed out in Washington, the idea is not new. Some machine tool builders already use the principle in their own products. "However, each company has its own standards. There is no intercompany interchangeability."

Obsolescence — Ford has aimed the concept at what Mr. Pippel calls ruinous recurring tooling costs. He cites a case in point: "Six years ago Ford's No. 1 engine plant in Cleveland was a production man's dream. But it had one serious defect—it was a monolithic monster — admirably adapted to the job for which it was designed but completely inflexible." Recent design changes in engines obsoleted the equipment, and much of it had to be dismantled and carted out the door.

He asserts: "We've got to stop building single-purpose production lines. We've got to make our machine tools flexible enough to accommodate the changes in product design which we must expect in this business every two or three years from now on."

Ford's answer is a sheet detailing "General Specifications for Interchangeable Components of Automatic In-Line Transfer Machines." All potential suppliers of new transfer machines are required to conform to these specifications. All in-line machines at the new Lima, Ohio, engine plant, for example, meet these requirements.

Two To Go—Mr. Daum told his Washington audience that the program is not complete. It will be necessary, he feels, for users and machine tool builders to co-operate in arriving at "industry-wide dimensional standards for mounting patterns of the major components required to construct nearly all production machine tools."

Next would come standardization of physical dimensions for spindle heights and mounting dimensions of manufacturer's power units. Ford already has suggested that a Joint Industry Conference be set up to consider problems that would have to be solved if the program is to succeed.

Plans Big Powdered Parts

Chicago Powdered Metal Products Co., Schiller Park, Ill., will install molding presses (up to 300 tons) in the plant addition it is building. They will accommodate parts up to 15 in. in diameter. Cost of expansion: About $150,000. Completion date: Jan. 1, 1958.

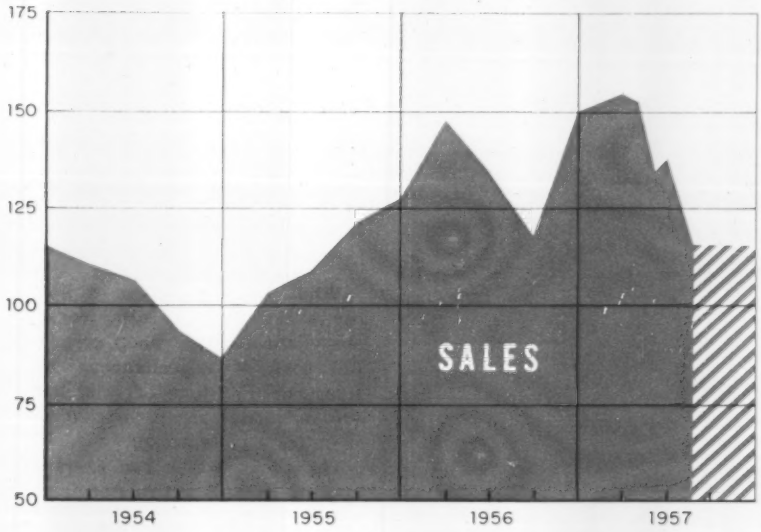
Builds Aluminum Plant

Capitol Products Corp., Mechanicsburg, Pa., will build a 70,000 sq ft aluminum fabrication plant near Sherman, Tex. It's scheduled to open in February, 1958.

The one-floor facility will serve a ten-state area. It will employ about 200.

Used Machine Tool Sales Level Off

(Index: 1947-49 = 100)



Source: Machinery Dealers National Association.
Last four months estimated by STEEL.

Used Machine Tools Slow

Potential market is large, but users' caution is a deterrent. Dealers' views vary, but most believe high rate of inquiries means pickup by second quarter of 1958

"WE have demonstrated used machines to interested inspecting parties, but in quite a few cases, the sale has not been made," says W. L. Thomas, president, Price-Thomas Inc., Cleveland. Many used machinery dealers are in the same boat.

Inspections and inquiries are high, but as Mr. Thomas puts it: "There seems to be a great deal of hesistancy on the part of management, a keynote of caution, due, no doubt, to the general feeling at this particular time. Let's face it —things are slow.

"We see no cause for serious alarm. We have had the usual amount of inspections, and many should materialize in 30-60 days."

Support—R. K. Vinson, executive director, Machinery Dealers National Association, Washington, feels the same way:

"Individual dealers' opinions range from bad to extremely good," says Mr. Vinson. "It is my opinion that sales for September and October will be better than August's, the usual low point in used machine tool sales."

Other Views — "Inventories (of used tools in dealers' hands), generally speaking, are high," says E. A. Golan, MacDell Corp., Chicago. "The position allows you to offer a greater range and selection of machinery to your customers.

"There is a reduction in sales and inquiries, compared with what they were last spring and in the winter of 1956-57. However, we are still getting inquiries and making sales. We look for this modest picture to continue for several months, with an increased volume by the second quarter of 1958."

Says J. T. Weiss, president, Interstate Machinery Co. Inc., Chicago:

"There have been signs in the last few weeks of far more activity on the part of manufacturers in the market for used machine tools. Based on this, it is our feeling that the fourth quarter and the first quarter of 1958 should show a reasonably good upturn."

From the East — Richard M. Nathans, Kings County Machinery Exchange, Brooklyn, N. Y.:

"There is an improvement in used machinery sales over the mid-summer lull. Heavy fabricating shops, structural and plate, are buying more presses, punching equipment, brakes, power presses, and bending rolls. Sales are not closed as readily as formerly, and users are more sensitive to price, but second half improvement over the second quarter is apparent."

R. Douglas Williams, Williams Machinery Co., Newark, N. J.:

"The sales curve for used machine tools usually follows the trend in orders for new tools, with a 30 to 45 day lag. Machine tool builders' bookings have declined most months for more than a year. As a result, a pronounced rise in used machinery sales cannot be anticipated."

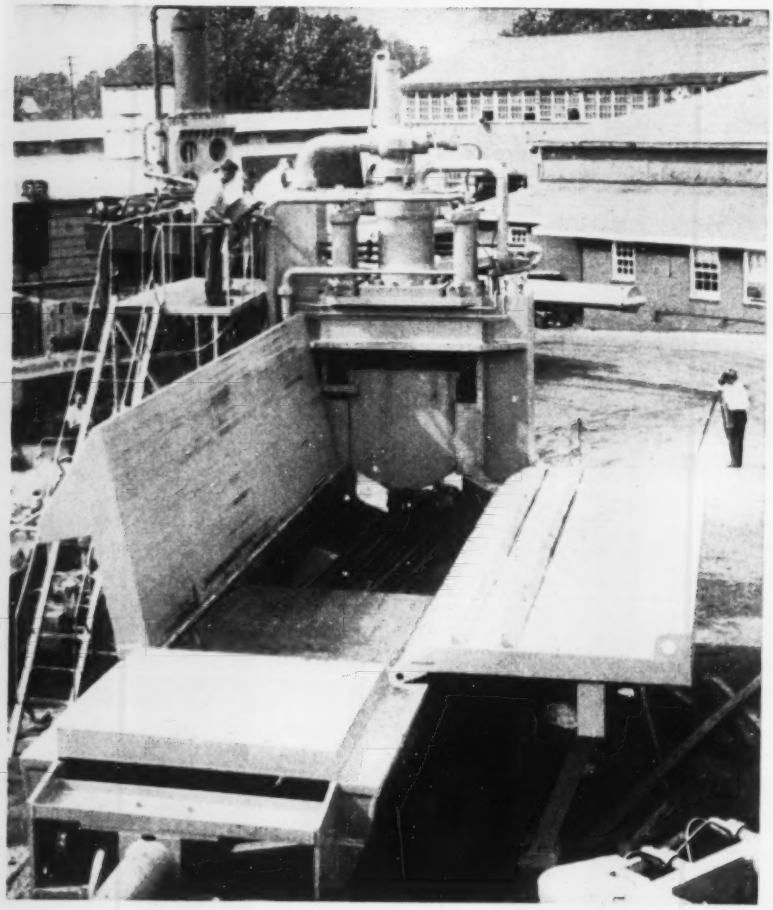
Bearing Maker Adds Plant

Split Ballbearing Div., Miniature Precision Bearings Inc., will build a 30,000 sq-ft plant at Lebanon, N. H., at a cost of $350,000. It will triple present floor space. The workforce of 75 will be doubled when the new facility is completed in the spring of '58. The present plant will be leased or sold next summer.

Rockwell Plans Realized

Rockwell Mfg. Co., Pittsburgh, has completed the expansion of its western Pennsylvania plants. More than 50,000 sq ft of manufacturing area, plus a new gas meter laboratory, have been added to the DuBois, Pa., plant. About 27,000 sq ft, including new engineering facilities, were added to the Uniontown, Pa., water meter plant.

At its Murrysville Laboratory, Rockwell is increasing testing capacity from 2000 to 7000 gallons per minute.



Harris Foundry & Machine Co.

This new hydraulic machine is designed to . . .

Shear Scrap, Cut Costs

"YOU'LL slash scrap-cutting costs 70 per cent!"

The promise is made to scrapyards and steel plants by a company which has introduced a new production model of a hydraulic scrap shear.

The maker, Harris Foundry & Machine Co., unveiled and demonstrated the king-size, highly mechanized shear before several hundred representatives of the scrap and steel industries at its Cordele, Ga., plant.

Test—A pilot model of the shear reduced scrap cutting costs to $1.50 a ton at the yard of Calumet Iron & Supply Co., East Chicago, Ind. (Over a ten-month trial, the average daily handling was 100 tons.) While costs will vary in different parts of the country, Harris believes the maximum per ton anywhere will not exceed $2, including depreciation on the machine, maintenance, and operation costs. Cost of preparing scrap with a conventional cutting torch and hand fed shear crew is $6 to $10 a ton, it says.

Two-Way Saving — The shear does two things: It reduces the number of men needed, and it increases output. Two or three men can do the job—one man to operate the shear, one man to operate a crane, and preferably one man to watch for objectionable materials. Work can proceed in almost any weather.

The Harris S-501 hydraulic scrap shear cuts up to a 5-in. round of steel or a 1-in. mild steel plate up to 5 ft wide.

What It Can Do—In 8 hours, the shear can cut: 100 tons of miscellaneous junk shop scrap, or 120 tons of miscellaneous farm scrap, or 150 tons of miscellaneous industrial scrap, or 200 tons of uniform plate scrap.

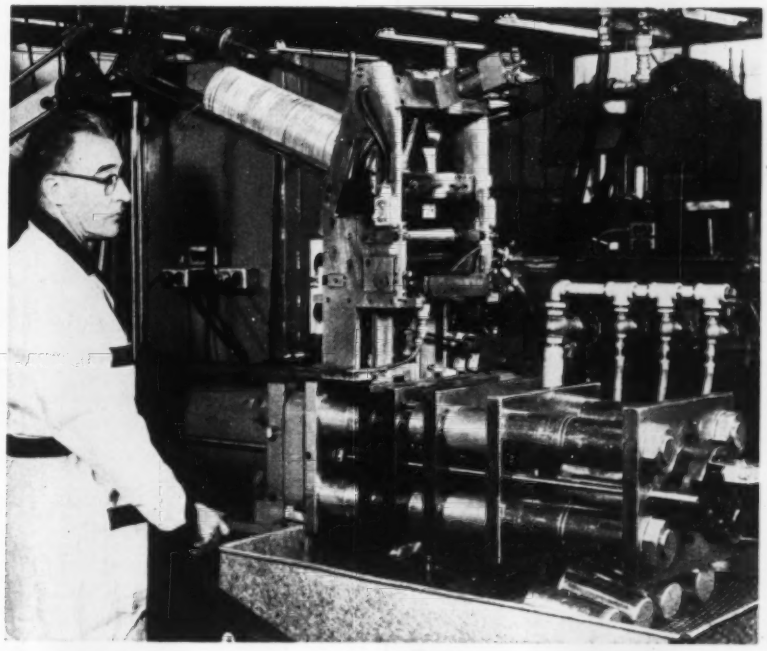
The shear, which can exert 500 tons of force, has an opening 30 in. high and 60 in. wide.

How It Works—From a charging box 264 in. long, 80 in. wide, and 30 in. high, scrap is fed to the shear. Charging can be done while the knife is shearing. Because the machine has a cover which exerts 78 tons of force, the charging box can take a tank up to 4 ft in diameter made of material $\frac{3}{8}$ in. thick. The cover smashes the tank, and the charging box ram, which operates with 50 tons of force, pushes the material under the blade.

The S-501 is equipped with automatic controls for continuous operation. Selling for $145,000 f.o.b. Cordele, Ga., it weighs 241,000 lb.

Giants—Scrap balers demonstrated by Harris offer further evidence of the trend toward king-size scrapyard equipment. Its second largest machine crushes an auto body into a bale in 1 minute and 35 seconds, weighs 390,000 lb, and sells for $225,000 f.o.b. Cordele. Its largest baler (it takes two auto bodies at a time) sells for $335,000.

Because of its sizable backlog for presses and shears, Harris is quoting delivery in eight to ten months, but it hopes to do better than that on shears through an arrangement with two other companies to build them. Harris hopes to manufacture three to four shears a month in 1958 and provide delivery in four to six months.



This equipment that can deep draw aluminum is big gun as...

Kaiser Aims at Can Market

A NEW DEEP DRAWING technique has put aluminum in a position to make a bigger bid for the can and container business.

Developed by Kaiser Aluminum & Chemical Corp., the process incorporates several dies in a single-stroke press operation to produce a container with a depth up to three times its diameter. Conventional methods limit depth to 50-60 per cent of diameter in a single draw.

Aiming at Cans—Kaiser's first target: Can manufacturers. "This development, along with present use of aluminum by canmakers, may well provide a new major market—challenging even the building market," predicts D. A. Rhoades, vice president and general manager. "Only 10 per cent of the present can market adds up to 200,000 tons of aluminum," he says.

The picture above shows the process in operation. Circular blanks are fed from the top. The hydraulic-actuated punch forces the disc through cupping, ironing, and bottoming dies in a single stroke. The seamless can emerges highly polished and requires only degreasing, trimming, and flanging. Another drawing punch operates simultaneously from the other end of the press.

Output Begun—Kaiser has installed a prototype of a commercial facility at its Wanatah, Ind., container plant and has started production on an order for 5.5 million cans from Kraft Foods Div. of National Dairy Products Corp.

Officials are waiting for operating results before revealing production speeds. They admit: "It's faster than conventional drawing but certainly not up to the 500-per-minute speeds of conventional lines that make tin plate cans. Investment in the aluminum line, however, is considerably less than the tin plate facility."

New Markets Opening — The technique opens a big potential market in the general container industry now primarily served by spinning, impact extrusion, and conventional drawing. The seamless can is easily adaptable to special shapes through additional forming operations.

One example is a new "pop" can being used by Air Reduction Co. to package its stainless steel welding electrodes. It's a two-piece container, with the top section's rim slightly flared to form a friction fit. A waterproof, airtight, industrial tape provides a hermetic seal.

Kaiser has also developed a new die which blanks, trims, sizes, and flanges shallow-draw containers in one stroke on a single-action, vertical press.

Expansion Progresses

U. S. Steel Corp.'s Youngstown District Works has put its new iron ore handling facilities into full operation.

Facilities in this third step of the company's blast furnace improvement program include a rotary car dumper and a series of rubber belt conveyors. The dumper unloads incoming ore in half the time previously required. Cars are emptied into a 3500-ton capacity steel hopper bin. A series of belt conveyors moves the ore at the rate of 3000 tons an hour to the 1.5 million-ton ore storage yard.

Form Two Companies

Jomac Inc., Philadelphia, and James North & Sons Ltd., London, England, have established two new companies to manufacture and sell each other's products. Jomac makes terry cloth work gloves; James North, work gloves and protective clothing. Jomac-North Inc. will install manufacturing equipment in Jomac's plants in Philadelphia and Warsaw, Ind. North-Jomac Ltd. will operate in North's two factories in Hyde, Cheshire, England.

H. Howard Colehower is president of both Jomac Inc. and Jomac-North Inc.

Coming: Another Look At Basic Research

NEW LEADERSHIP in basic research may soon come from the federal government. The National Science Foundation, the scientist's best critic in this country, has come out with recommendations which Congress will probably endorse next year.

NSF's director, Dr. Alan T. Waterman, has presented President Eisenhower with several hard-hitting ideas on how to promote basic research. It is expected that the President will transmit the ideas to Congress in January.

Dr. Waterman's main points: 1. Industry must give more money to universities and nonprofit groups for basic research. 2. Management must give scientists a free hand. 3. Uncle Sam should encourage industrial trade associations and professional societies to support basic research. 4. The federal government should match state funds for basic research in state schools. 5. Tax laws should be changed to encourage gifts for basic research. 6. Government agencies should cut applied research and increase basic research. 7. Federal grants should carry a minimum of restrictions on the direction basic research should take.

Before It's Too Late

In some senses, Dr. Waterman's report to Ike is an ultimatum: We must change our ways before it is too late. He is particularly concerned about two aspects of research in this country: 1. We don't spend enough money. 2. We don't spend it in the right places.

This year we'll spend about $500 million on basic research. All research (including applied and development work) costs the nation about $7 billion. It is noteworthy that the Air Force's "Operation Farside," which sent a rocket 4000 miles into space, cost only $750,000, and there were top men in the Pentagon who wanted to cut that off.

Dr. Waterman agrees that the U. S. spends more than any other country in the world on basic research, yet, he adds, our potential is tremendously greater than the $500 million allows us. NSF grants money for basic research to only about one-third of its applicants. Its fiscal 1958 budget is $40 million, but only $22 million goes directly into research.

The Russians may use as many as one-third more scientists in basic research than the U. S.

From whatever source more money comes, Dr. Waterman thinks most of it should be placed in the hands of the universities, the "traditional" place for such work to be done.

Answer: Cabinet Level for Science

On Capitol Hill, sputnik has Congress thinking about the need for a cabinet level science post. Sen. Estes Kefauver (D., Tenn.) is one of many favoring the idea.

We need a man, says Senator Kefauver, "to gather all the bits and pieces of research and development that are being done throughout the government" to create "one, hard hitting, co-ordinated program."

Citing the case of Dr. Robert Oppenheimer, Senator Kefauver also wants a new look at our security regulations, which he terms "antiquated."

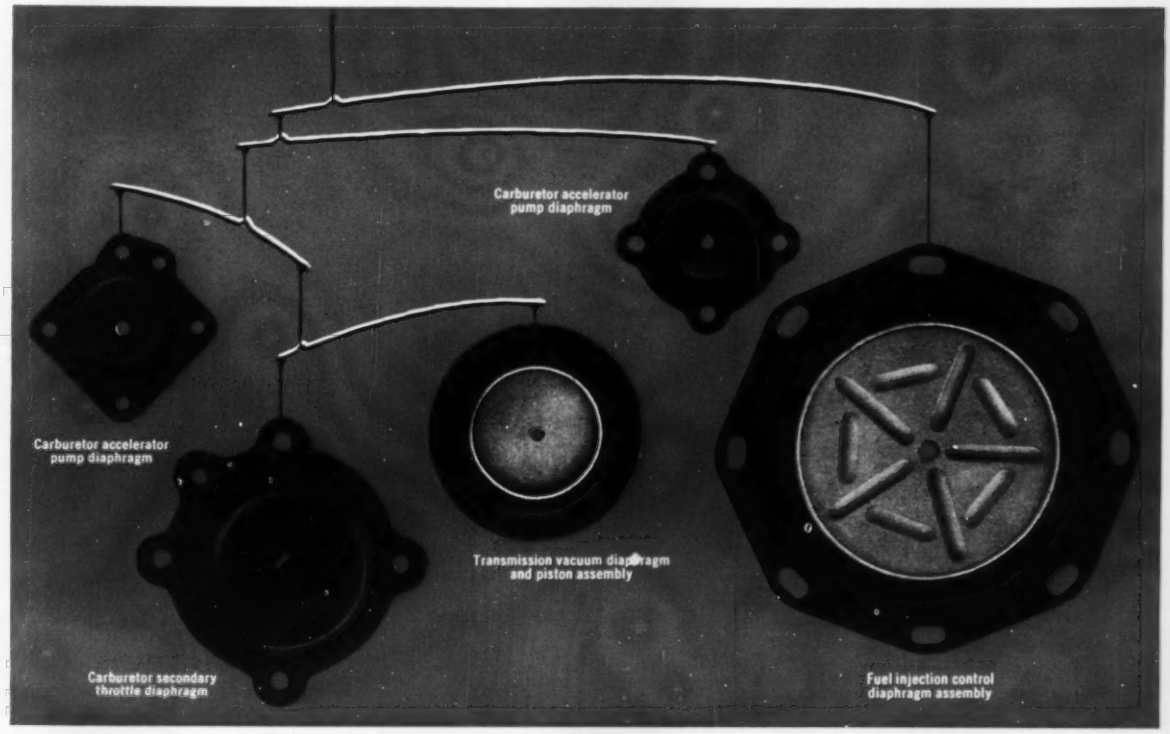
New Hope for Continuous Casting?

R. Easton, manager of the continuous casting section, Koppers Co., told Sen. Estes Kefauver's (D., Tenn.) subcommittee: 1. He "hopes" that, within one year, a major steelmaker will order a continuous casting machine capable of making slabs from 200 ton capacity, open hearth furnaces. 2. Within three years, the machine will be in commercial production. 3. After proving itself, continuous casting will become widely used in new facilities. Mr. Easton did not make a case for replacing facilities with the process. While generally satisfied with U. S. steelmaking research, he noted that Russia expects to continuously cast 20 per cent of its steel by 1960.

Much Progress in Europe

Senator Kefauver reported the State Department as saying: 1. Russia probably has one plant capable of producing 200,000 tons of continuously cast steel a year. 2. At least nine research centers and steel plants in Russia have been using the process—one since 1949. 3. Half the production built by Russia in its five-year plan ending in 1960 will use the method. 4. Over 30 installations throughout the world use the process; 13 are industrial enterprises (though perhaps they're not up to U. S. commercial standards).

Meet Arvid O. Lundell: He's the new adviser to Andy Olsen, director of the metalworking equipment division, Business & Defense Services Administration. Mr. Lundell is president of Colonial Broach & Machine Co., Detroit. He will be in Washington for about six months, where he may be reached at the Commerce Department: Phone STerling 3-9200. Extension 3526.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Carburetor accelerator pump diaphragm
Transmission vacuum diaphragm and piston assembly
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Simple or complex, your diaphragm problem can be solved quickly, dependably with the help of C/R Sirvene engineers. Their specialized experience gained in the solution of hundreds of similar problems is yours to use. They will design and compound the correct elastomers to produce the exact degree of hardness, tensile strength, compression set, volume change and flexibility you require. Temperature resistance, with various materials, ranges from —100° to 500°F., and compatibility with an equally broad range of fluids, gases and solids, including petroleum base fuels and synthetic hydraulic oils can easily be achieved.

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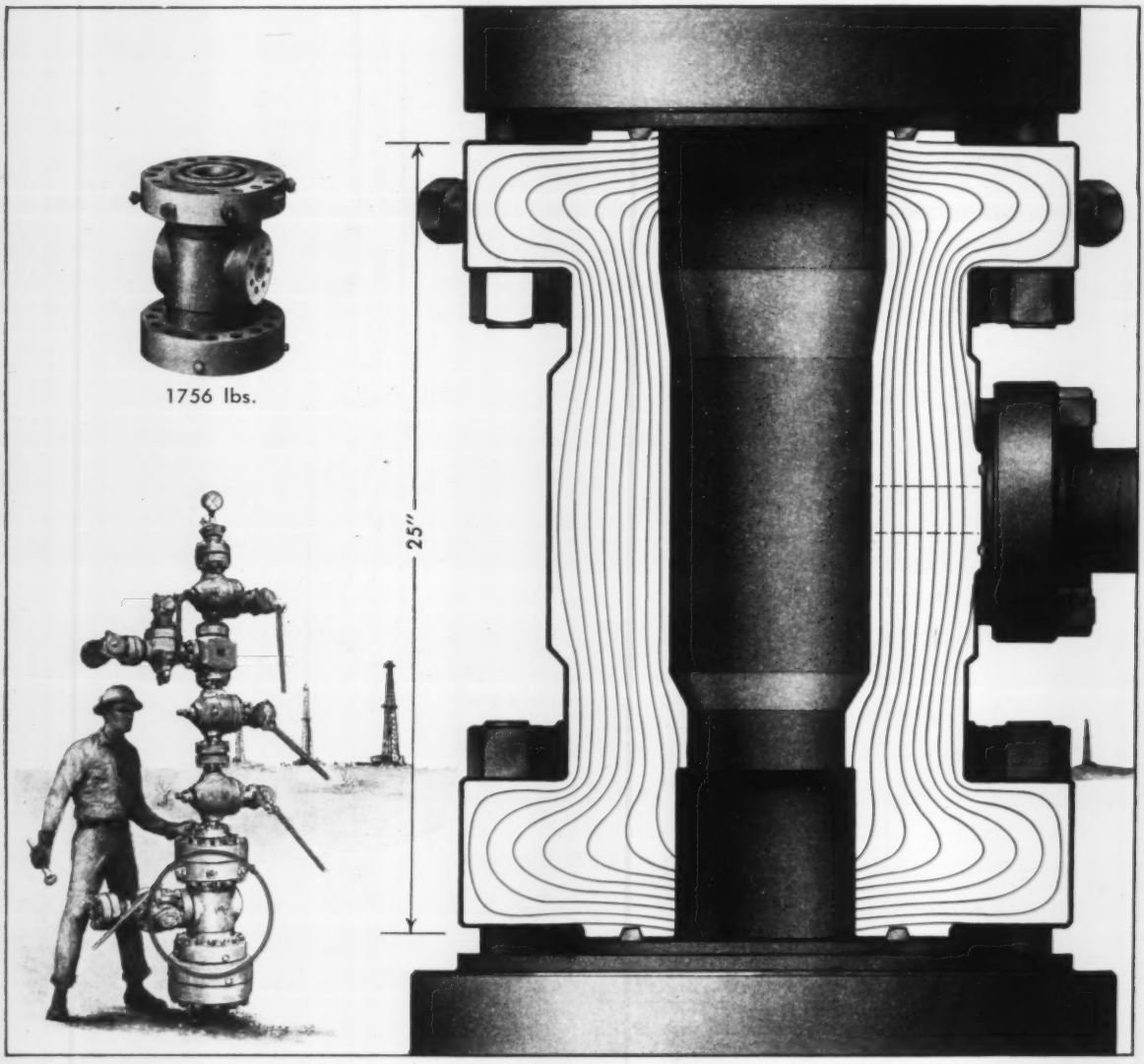
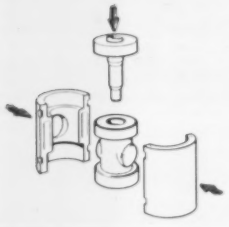


SPLIT-DIE STEEL FORGING SOLUTION FOR 15,000 PSI CHRISTMAS TREE PROBLEM



This tubing head spool for oilfield Christmas Trees is still another example of the superiority of Cameron's split-die steel forgings. Thousands of these critical components are on the job almost everywhere oil is produced. The model above must first withstand 22,500 psi test pressure to operate safely at 15,000 psi working pressure — but this is only the beginning. When set, it must be able to support in excess of 300,000 lbs. of heavy steel tubing suspended miles below the earth's surface.

The exclusive Cameron split-die forging process produces two important advantages — 1) Shapes impossible to produce by any other forging method, and 2) Grain flow to meet the most extreme performance demands. The inherent forging advantage of great strength with less mass has been extended to include a new design range. Open center sections, curved or flat surfaces in almost endless variety and odd protrusions are routine design elements when Cameron split-die forgings are specified. These vastly superior ferrous parts are forged to 8,000 lbs. weight.

Cameron is busy today producing split-die forged steel parts for jet engines, guided missiles, atomic reactors and, of course, Cameron Christmas Trees.

Our complete production facilities, from melting of high quality alloy steels to finished machining if desired, allows undivided responsibility — that's another reason why we are serving more customers every month. If you are using castings where forging quality is desired, or if conventional forgings are inadequate, write, call or come by—

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SPECIAL PRODUCTS DEPARTMENT

For a 65-year-old valvemaker . . .

Rejuvenation Pays Off

LIFE BEGINS at 65 for Golden Anderson Valve Specialty Co. Inc., Pittsburgh. Awareness of the company's potential, reflected in a new marketing philosophy, brought about the rejuvenation.

Founded in 1892, the firm settled into a life of middle-aged respectability following the death of its former owner in 1934. "Everybody knows we make valves, so wait for the orders to come in," could have been the company's sales slogan in the early 1950s.

Middle-Aged Laxity—Grant A. Colton, chairman and president, explains: "Our former owner left the company in trust, controlled by a Pittsburgh bank which hired a manager. Restricted in our expansion and under 'absentee management,' we didn't move out of our orbit.

"We made the same valves with limited applications for many years. The bulk of our sales went to municipal waterworks. Although our valves served successfully, we weren't known generally as an industrial valve supplier. Management had no plans for developing broad industrial markets."

Rebirth—That middle-aged feeling ended and facelifting began in December, 1956, when Mr. Colton, John H. Kilmer Jr., executive vice president, and Paul B. Brauer, in charge of production, acquired all outstanding stock.

"We had two choices: Sell principally to municipalities for a steady sales plateau, or enter the tough and competitive, but rewarding, field of industrial sales. We took the hard road, which led to sharply increased sales in the atomic, pulp and paper, and chemical processing industries," Mr. Colton says. "Steel industry sales are rising, with applications in hot strip lines, on hydraulic rams, and in quenching of coke, pig molds, and ingots. Automated steel mills provide added uses."

Growth—In less than a year, the new management doubled productive capacity and office space, increased basic valve designs from 10 to 15, and added a research center in Pittsburgh. The switch in the company's sales target makes the added capacity essential.

"Focusing our sights on the industrial market, we're designing new valves to broaden our product base," Mr. Colton explains. "For the first time, we're selling valves for specific applications, instead of simply distributing them."

Promotion — Product literature aimed directly at the purchaser helps Golden Anderson reach the industrial buyer. Mr. Colton adds: "Once our printed material was highly technical and difficult to read. It described all the valves but didn't give much information about where they could be used. The potential customer had to decide how he could fit them into his operations. If he had the time and patience to do this, we had a good chance to get his order.

"Now we are streamlining our product information. We diagram the operation of each valve. The potential user can quickly see its application. Then he can get technical details from us."

Ripe Old Age—"If inquiries indicate coming demand, 1958 will be another peak year," the firm's president predicts. Thanks to its new markets, the management group will pass its freshman test with record sales—they'll be at least 15 per cent above the best of 64 previous years. Industrial sales are surpassing those to municipalities. Mr. Colton expects the trends to continue in 1958.

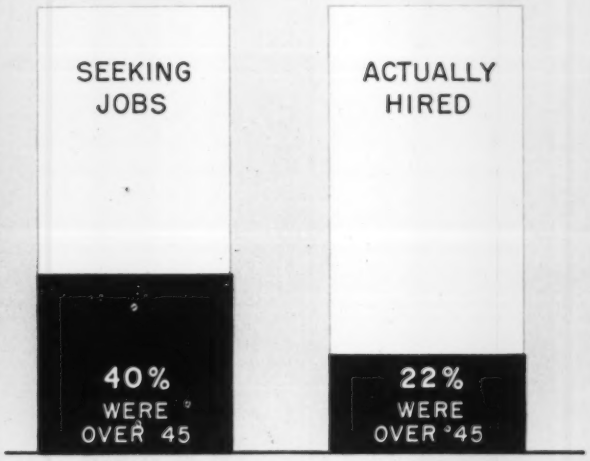
Armco Boosts Pipe Output

Armco Steel Corp., Middletown, Ohio, will spend $1.5 million to boost spiral-welded pipe production by 2000 tons a month (see STEEL, Oct. 21, p. 32).

A 57,600 sq-ft building will be added to the firm's No. 2 fabricating plant in Middletown. Two pipe machines will be moved from another plant and a 25-ton overhead crane, a water tester, an end-facing machine, and generators will be purchased. Double-switching railroad trackage, water and power lines, and roads will be built.

The new facility will produce pipe in 8 to 36 in. diameters and lengths up to 90 ft.

OLDSTERS: Job Prospects Shaky



Source: U. S. Department of Labor's area study of Seattle, Los Angeles, Miami, Fla., Worcester, Mass., Minneapolis-St. Paul, Philadelphia and Detroit.

Help Wanted: 10 Million More Jobs by '65

SOME 38 per cent of the U. S. labor force is 45 and older. The proportion will rise rapidly in the next decade, but much of industry, including metalworking, shies away from hiring workers in their mid-40s.

By 1965, says the Department of Labor, 10 million more workers will be needed to achieve a gross national product of $560 billion to meet the demands of 193 million people. Projected shifts in the age content of the population (STEEL, June 3, p. 62) show that the 25-45 group will shrink by 2 million in the next seven years, while the 20-65 group will increase by 7 million.

Age Barrier—Of the 10 million additional workers industry will need by 1965, half will come from the natural increase in the working population. Industry can get the rest by digging into the older age brackets. But it won't if present hiring practices continue.

Few, if any, companies have an official limit on age in their hiring policies. Many point out that where special skills are involved age is no consideration. But the fact remains that the average worker in his 40s has more trouble finding a job than someone younger with comparable abilities.

Reasons—"Our hiring practices are strongly influenced by our policy of promotion from within," says a steel producer. "In addition, a company which tries to do a conscientious job of organization planning for the most efficient use of manpower has its own people aging steadily.

"In this situation, the hiring of older people would shift the organization out of balance and load it more heavily on the older side."

Says another: "A major deterrent to hiring people over 45 in the steel industry is the fact that they become eligible for a non-contributory pension after relatively few working years."

Controversy — Many organizations are conducting campaigns attempting to convince industry that it is losing valuable skills by not hiring older workers.

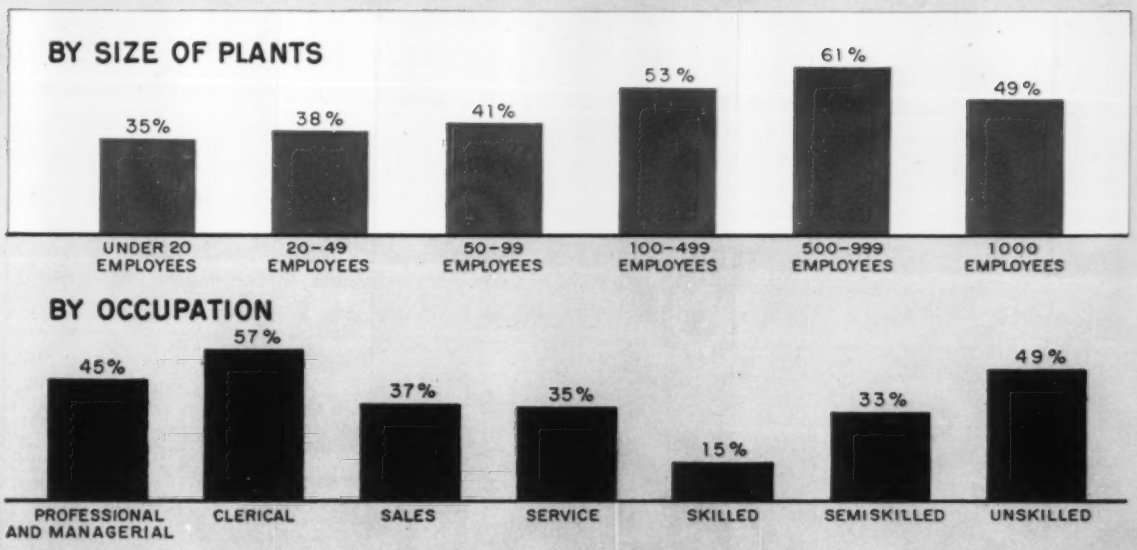
National Sales Executives Inc. reported early this year that 72 per cent of its members would not hire salesmen over 45 (STEEL, Feb. 25, p. 65).

The report terms the situation "incongruous." It warns that business and industry are wasting manpower by refusing to consider older, experienced people.

The Small Business Administration concluded from a recent survey of older workers: 1. Their absentee rate is lower. 2. They have lower injury rates. 3. Productivity does not drop as the employee ages. 4. There is less labor turnover among older people.

Federal Law?—There is interest in Congress in attaching riders to

JOB OFFERS...Restricted to 'Under 45'



appropriation bills that would bar a firm from government contracts if its hiring were limited by age requirements.

Pro, Con Examples —A Department of Labor survey last year tends to show that hiring practices cannot be successfully controlled by law.

Massachusetts has a law which prohibits age discrimination in hiring. In Worcester, for example, a check showed that 53 per cent of those seeking jobs through the state employment service were 45 and over. Of requests from firms seeking employees, 39 per cent had age limits and only 21 per cent of those hired were 45 and over.

In Los Angeles, where a vigorous campaign has been conducted to persuade employers to hire older people, 33 per cent of those seeking jobs were 45 or over. Only 32 per cent of employer requests had age stipulations, and 24 per cent of those hired were in the upper age bracket.

Age an Asset—"We hire both men and women over 50," says Warner Seely, vice president, Warner & Swasey Co., Cleveland. "If we feel a person is qualified for a job that is open, we do not bar him because of age.

"Our experience bears out the claims of the SBA."

Says Stacy R. Black, staff director, executive department, Thompson Products Inc., Cleveland: "For as long as I can recall, we have had a policy of employing people on merit, irrespective of age. But we feel that the successor to a department head ideally ought to be 10 years younger."

Cost—The Department of Labor says that its research into comparative costs (pension and insurance) of hiring shows that the outlay for a man of 55 is about a penny an hour more than it is for a man of 30. It reports that the slight advantage in favor of the younger man is erased when you take his longer working life (and pension cost) into account.

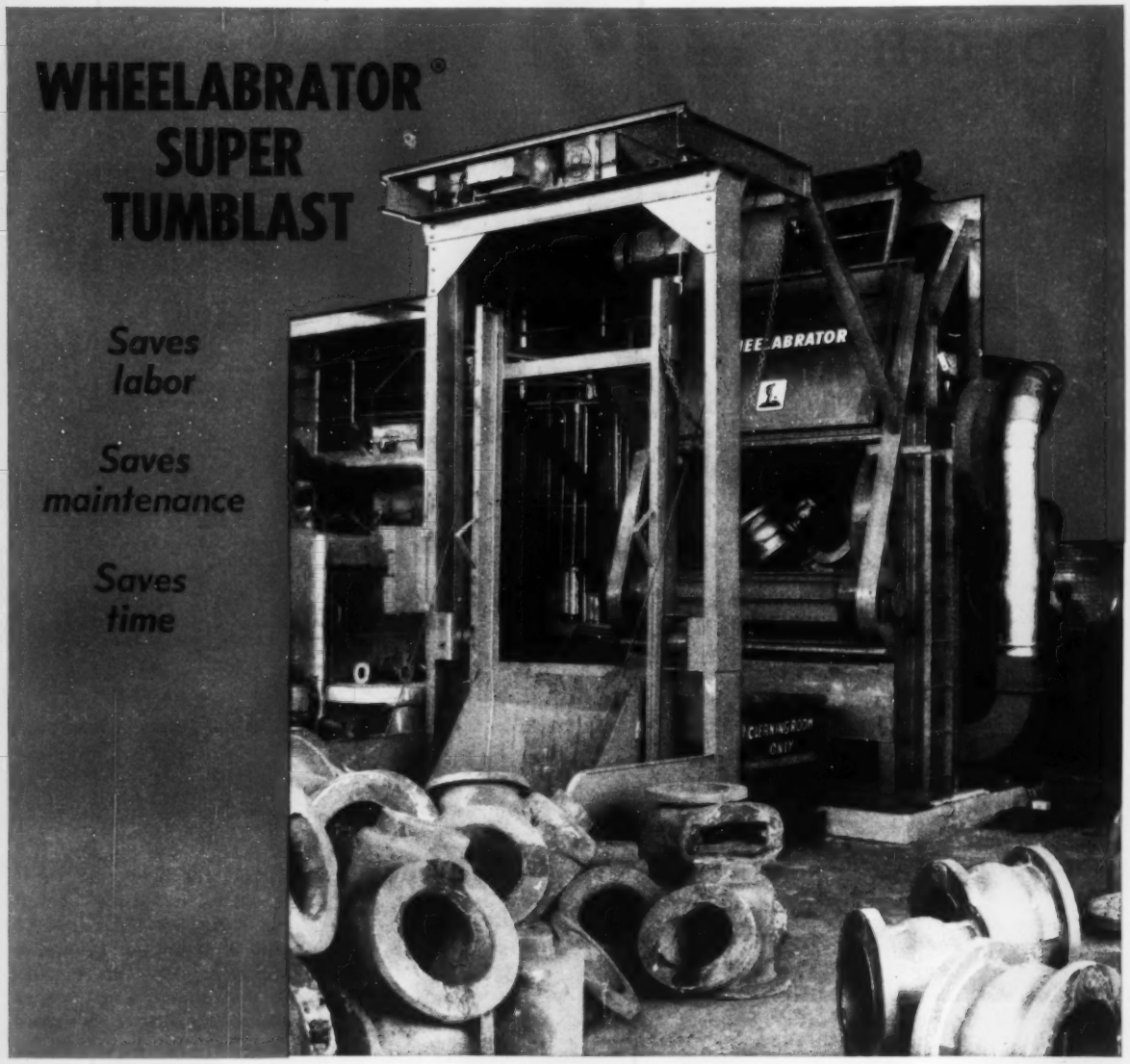
Long Term Solution—"It is a matter of education and the condition of skilled labor supply," says Harrison H. Flick, Ohio State Employment Service, Cleveland.

"When companies cannot get younger men, they will take those who are older," he says. "But it is a long, hard wait for a man 45 or 50 who is trying to support a family on unemployment compensation."

Expensive Age—For the fiscal year ended June 30, social security accountants were alarmed to learn that benefits paid out during that 12 months exceeded income from the payroll tax by $125 million. For the same period, $5.3 billion was paid out in benefits, a figure expected to triple by 1975. The payroll tax is not likely to increase that much.

Rising costs of social security and unemployment benefits can be met largely from only one source: Taxes. As the clamor increases over inability of persons over 45 to get jobs, social security age levels may be lowered.

Management's Choice—Industry must decide—and soon—whether it is best, morally and economically, to provide gainful employment for older people, or to pay more in taxes for their support.



Super Savings for Pacific-Southern Foundries, Inc.

Labor requirements slashed three men daily! Cleaning time drastically reduced! Cleaning department geared to production requirements! These are some of the super savings Pacific-Southern Foundries, Inc., Bakersfield, California, obtained with the installation of a 28 cu. ft. Wheelabrator Super Tumblast for cleaning cast steel high-pressure valve bodies and parts.

Cleaning approximately 70 tons of steel castings per day, the Super Tumblast handles the bulk of all cleaning—about 60%—faster, more efficiently and at less cost than by previous methods. Castings cleaned range in weight up to 800 lbs. Typical loads weigh approximately 3000 pounds. In eight months time — 1618 wheel hours — maintenance required has been even lower than expected!

This super-performance is typical of that obtained by all kinds of foundries with the Super Tumblast. Available in three sizes, the Super Tumblast can make similar savings for you. Write today for complete information.

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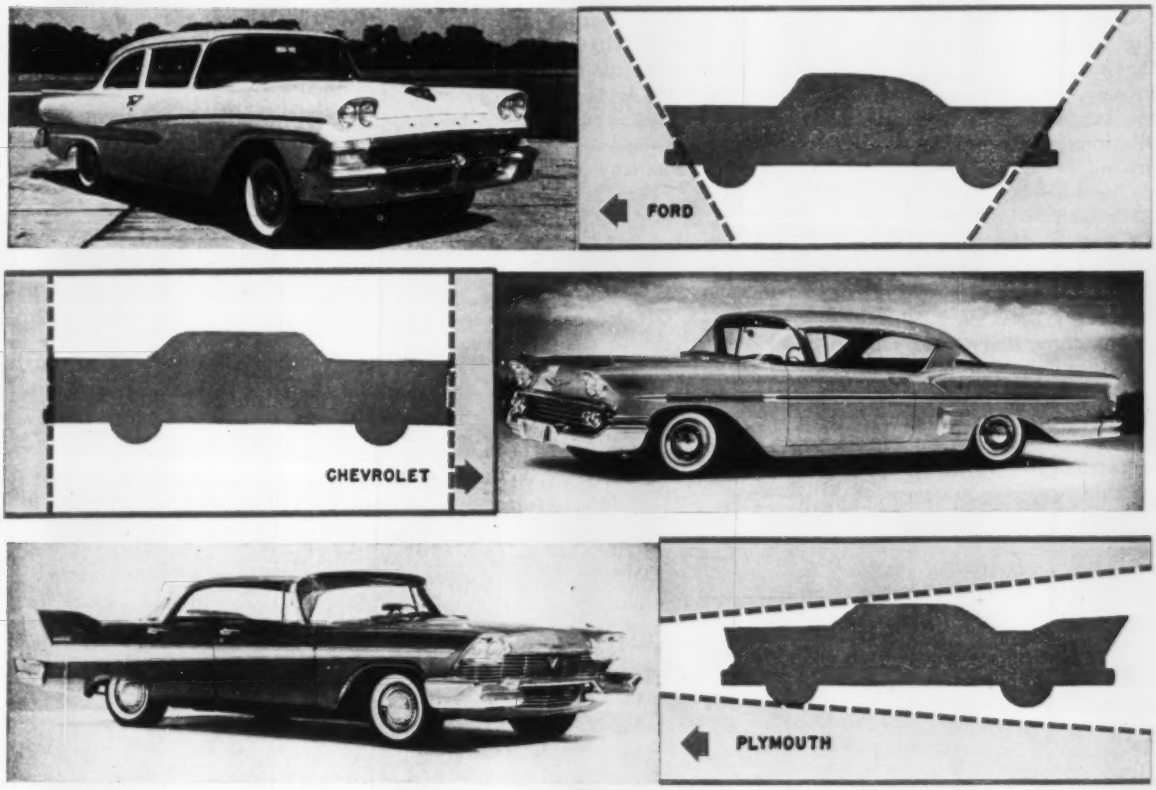

Styling Trends Jell

AS 1958 CARS appear, it's increasingly evident that styling trends developed in the last few years won't be radically changed through 1960.

It doesn't mean there won't be refinements in appearance, or modifications in designs.

Settled—But it's obvious GM's box shape, Ford's sculptured steel designs, and Chrysler's flying wedge are the patterns car designers have settled on for the rest of the 1950s.

George Walker, Ford's vice president of styling, puts it this way: "The industry will gradually settle down and improve on present styling trends."

Limits—In '56 and '57, models were made to look drastically different by lowering heights 3 to 5 in., but the human body can only be squashed so much.

Roy A. Brown, chief stylist for Ford's Edsel Div., says: "The trend toward lowering automobiles probably can still be pursued although ultimately a point will be reached where further decreases will no longer be attainable."

With present body shells, the height limit seems to be about 52 to 54 in. So from the styling standpoint, basic bodies probably won't be changed much. Appearances will be modified with sheet metal changes and trim designs.

Ford—Mr. Walker calls it improvement instead of refinement. He indicates that in the next few years Ford will emphasize interior trim.

"More changes can be expected in the glass area, which will give airiness to the cars," says Mr. Walker. Cockpits instead of seats may appear. Instruments, instrument panels, and steering wheels will be readapted, he adds.

Chrysler—When the "Forward Look" company brought out its '57 models and started saying, "suddenly it's 1960," the industry didn't realize how true the statement was.

Fins have paid off for Chrysler, and the company has no intention of changing present styling trends for the next two years.

Although the 1958 Chrysler products underwent what used to be considered a conventional face-

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lift (grilles, lights, and trim), 1959 cars are expected to veer more to sculptured styling in sheet metal areas.

GM—The largest member of the Big Three looks like the only one that's still not convinced it wants to keep present body shells. With the exception of Cadillac, the other divisions still seem to be looking around for a better theme.

Chevrolet has made the most of GM's loaf-of-bread concept in its '58 cars. But even Chevy isn't satisfied. It's rumored that the division will make a second major styling overhaul on 1959 autos.

Dopesters claim two more GM divisions will add fins to present bodies in '59.

AMC—Unitized bodies eventually will give American Motors an opportunity to revise its styling if George Romney, AMC's president, changes his mind.

So far, Mr. Romney indicates he believes economy—in design as well as in operation—will pay off better for AMC. The Rambler series shows no signs of drastic styling changes for the next two years.

One thing is clear: Cars can't get much longer or lower. The Big Three aren't going to retreat. Styles will be refined to make cars look longer, lower, and sleeker without actually changing basic body dimensions.

GM, Chrysler Earnings

General Motors Corp. reports nine-month sales of $8.2 billion, compared with $8.1 billion at the 1956 third quarter mark.

Net income for the same period is $603 million, compared with $640 million last year.

The 6 per cent drop in income has been caused mostly by a slump of 9 per cent in 1957 car deliveries.

In the first three quarters, GM has produced (U. S. only) 2,119,943 cars and 314,447 trucks. It turned out 2,355,313 cars and 337,175 trucks in the same period last year.

Average employment is about 20,000 less than it was in 1956.

The company expects the loss in income will be less than 6 per cent for the whole year because of an anticipated sales pickup in the fourth quarter.

Chrysler—Nine-month earnings of Chrysler Corp. show it has a net income of $103.5 million, compared with $6.2 million in 1956.

In 1955's record year, Chrysler had earned $70.6 million at the end of three quarters.

Reported sales so far this year are $2.7 billion, versus $1.8 billion last year.

The company says it has sold 1,082,801 cars and trucks in nine months. For the same 1956 period, it reported 763,718 unit sales.

Specs on 1958 Cars

Here are the basic body and engine specifications for the Ford, Chevrolet, and Plymouth pictured on the preceding page:

Chevy's Impala—It comes in a convertible and sport coupe in the Bel Air series. Wheelbase is 117.5 in.; length is 209 in. The car is 2.5 in. lower than last year's.

The Impala is powered by a 348 cu in. V-8 with a 9.5:1 compression ratio. Four-barrel carburetors are standard; horsepower is 250/4400 rpm.

Fairlane 500—Ford's low-priced, luxury car for 1958 is 207 in. long, with a 118 in. wheelbase. It is 56 in. high, 78 in. wide, carries a 2.91:1 axle ratio with Fordomatic transmission.

U. S. Auto Output

Passenger Only	1957	1956
January	642,089	612,078
February	571,098	555,596
March	578,826	575,260
April	549,239	547,619
May	531,365	471,675
June	500,271	430,373
July	495,629	448,876
August	524,354	402,575
September	274,265	190,716
9 Mo. Total	4,677,136	4,234,768
October		389,061
November		581,803
December		597,226
Total		5,802,808

Week Ended	1957	1956
Sept. 28	51,552	43,369
Oct. 5	21,975	59,367
Oct. 12	38,626	70,175
Oct. 19	72,180	88,557
Oct. 26	103,277†	104,269
Nov. 2	118,000*	117,583

Source: *Ward's Automotive Reports.* †Preliminary. *Estimated by STEEL.

The standard engine for the 500 is a 332 cu in. V-8 with a 9.5:1 compression ratio and two and four barreled carburetors. With four barrels, the engine is rated at 265/4600 rpm horsepower. Torque is 360/2800 rpm.

Plymouth — Chrysler's low priced cars have the same body dimensions as they did in 1957, but they're powered by a new family of engines.

Standard powerplant for Plymouth lines is the Fury V-800. This engine has a 9:1 compression ratio; 318 cu in. displacement. With dual carbs, it has a torque rating of 330/2800 rpm. Horsepower is 225/4400 rpm. An optional 315 hp engine is equipped with fuel injection.

Boost Tire Prices

Tire manufacturers report a 2 per cent price increase for original equipment tires sold to auto manufacturers. The increase took effect Oct. 1. The last tire price boost was 3 per cent in July.

Auto industry sources indicate the increase will be passed along to 1958 car buyers although it will be buried in the total car price.

Original equipment sales for passenger cars, trucks, and buses generally account for one-third of total tire sales. Replacement sales make up the remainder.

Last year, tire builders shipped about 53.3 million passenger car replacement tires, according to E. F. Tomlinson, president, B. F. Goodrich Tire Co., Akron, division of B. F. Goodrich Co.

For 1958, Mr. Tomlinson looks for a 6 per cent increase in replacement tire sales to the passenger car market.

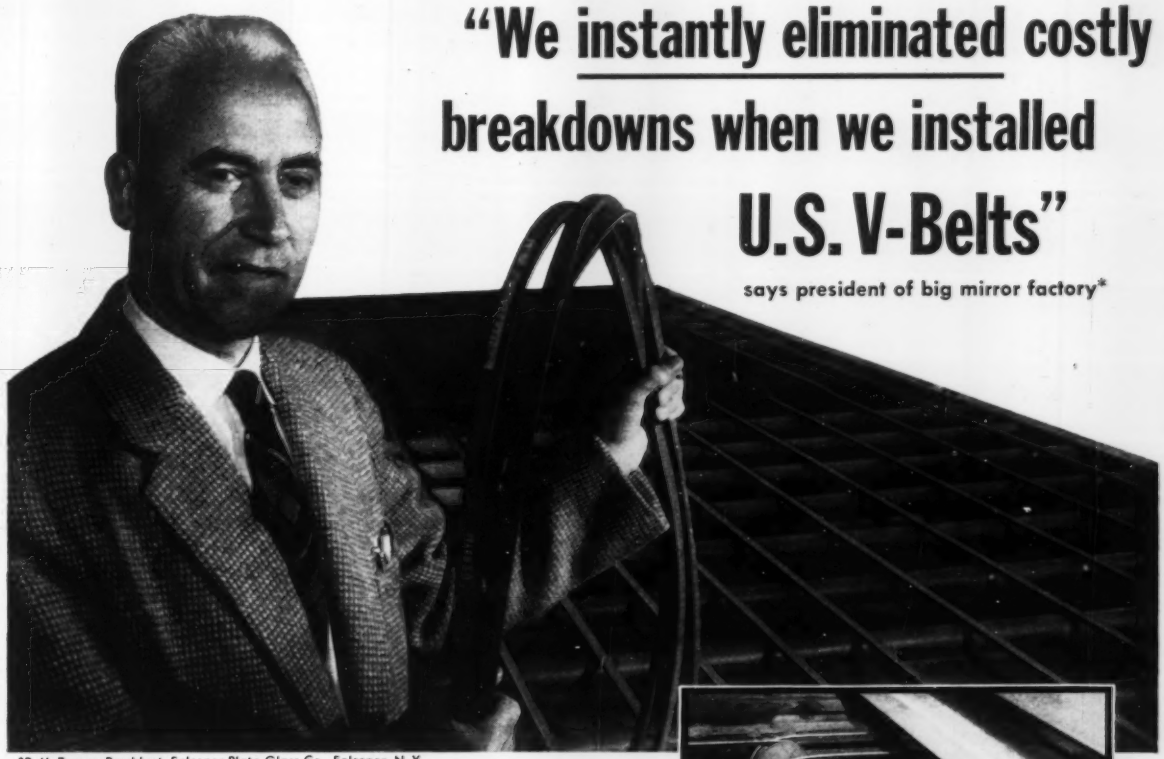
Exhaust Notes

- The Edsel contains 36 lb of stainless, says Richard E. Paret, of the stainless steel producers committee, American Iron & Steel Institute.
- Harlow Curtice, GM president, reports the firm's $204.5 million expansion program in Europe is virtually completed. He foresees expanding markets for autos, appliances, and other consumer goods in Western Europe.

ROYAL SUPER-SERVICE V-BELTS

"We instantly eliminated costly breakdowns when we installed U.S. V-Belts"

says president of big mirror factory*



*R. H. Turner, President, Falconer Plate Glass Co., Falconer, N. Y.

In this factory, 2 and 3 breakdowns (at $200 each) a day occurred on their production line. The flat belts, carrying the mirrors, often became unsynchronized and chipped the glass. High tensions and low speeds put too much strain on the motor. A change was imperative.

So, a new system was designed, using U. S. Royal Super-Service V-Belts to carry the mirrors. These extra strong belts eliminated slippage, decreased belt tension, got rid of belt stretch and reduced the motor strain.

"These belts have been on the job since July, 1956," says Mr. R. H. Turner, "and we haven't had one single breakdown. Each is as good as new, despite the wet operating conditions common to our type of business."

United States Rubber, *the foremost name in power transmission belt drives,* produces the U. S. Royal Super-Service V-Belt in *the largest and most modern transmission belt plant in the world.* A complete line of belting, plus expert engineering service, is available at selected distributors, at any of our 28 District Sales Offices, or write us at Rockefeller Center, New York 20, N. Y.

In Canada: Dominion Rubber Co., Ltd.

Top photo shows U. S. Royal Super-Service V-Belts on the cooling section of the production line. Lower photo is close-up of U. S. Royal Super-Service V-Belts on the silvering-washing conveyor line. The sheave is made of Uscolite®, U. S. Rubber's strong, light-weight, corrosion-resistant thermoplastic.

Mechanical Goods Division

United States Rubber

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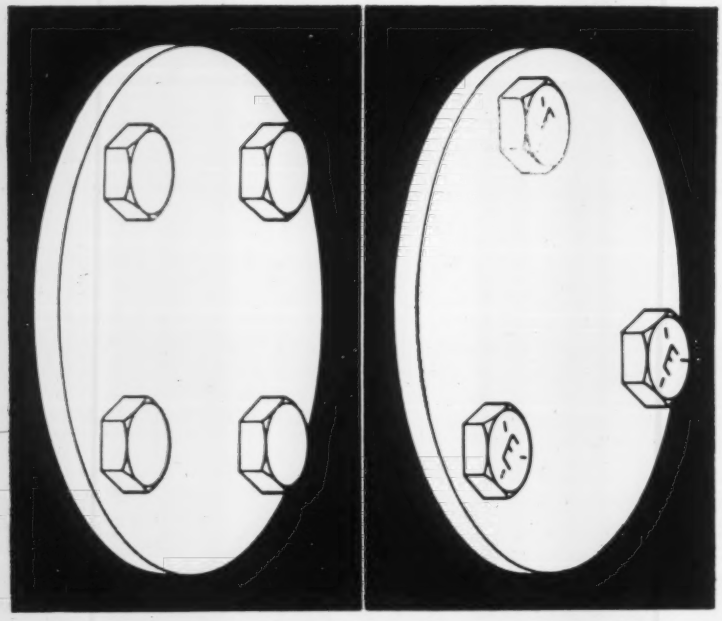


SIMPLE CHANGE SAVES UP TO 40% ON FASTENER COSTS

● High strength bolts deliver more "holding power" per dollar

● Savings in production can also be realized

Figure the cost of fasteners as if you're buying *clamping force* to hold together an assembly. This way, $1.65 worth of "holding power" in machine bolts costs you only $1.50 if bright cap screws are used . . . but only $1.00 in high carbon bolts.

Viewed another way, it means that the stronger fastener can be smaller for a given application, and so costs less. Or it can mean using fewer fasteners.

Either way, you save. On direct fastener costs; on manufacturing. With *smaller* fasteners, there are smaller holes to drill (or maybe you can even go to punching). With *fewer* fasteners, there are fewer holes to fill. (In the sketch above, fastener assembly time would be cut one-fourth.)

• **Case History:** Where an application is suited to high strength bolts the savings can be substantial. One Midwest farm equipment plant that standardized on them saved $12,000 the first year, $28,000 the second.

Manufacturers willing to review their requirements with an RB&W Fastener Man may find it rewarding. He's a technical specialist who can help you save money in assembling your products with standard fasteners. Russell, Burdsall & Ward Bolt and Nut Company, Port Chester, N. Y.

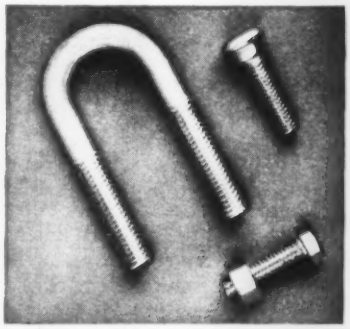
R B & W
112th year

Plants at: Port Chester, N. Y.; Coraopolis, Pa.; Rock Falls, Ill.; Los Angeles, Calif. **Additional sales offices at:** Ardmore (Phila.), Pa.; Pittsburgh; Detroit; Chicago; Dallas; San Francisco. **Sales agents at:** Milwaukee; New Orleans; Denver; Fargo. **Distributors from coast to coast.**

Spin-Lock Screws solve assembly problem

The designer specified countersunk-head screws to be used in a particular casting. The production man had to stake these in to anchor them. But this meant extra operation, made screw removal damaging and difficult.

The answer was found in Spin-Lock screws. These have hardened "ratchet-action" teeth that bite in when tightened, take 20% more torque to loosen than to tighten, can be reused. Send for Bulletin.

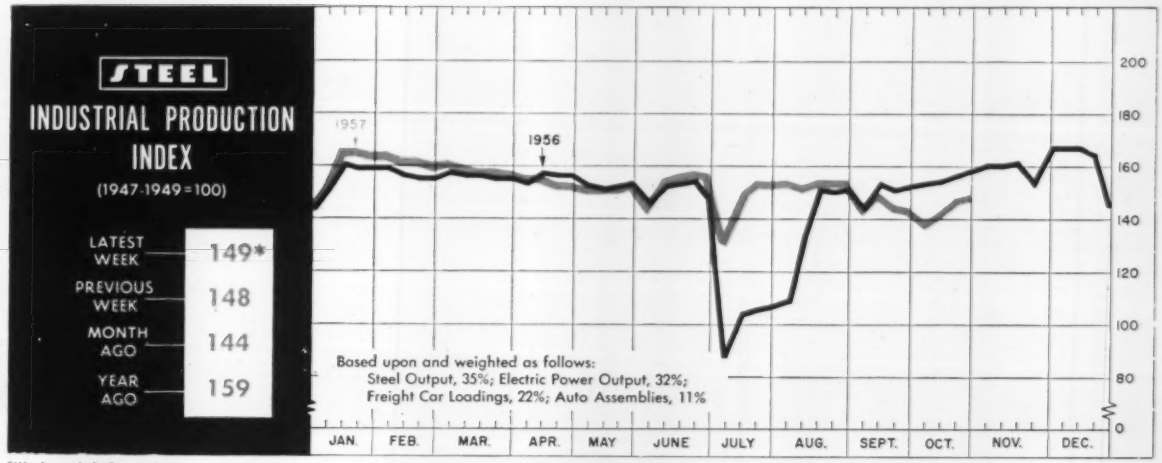


Silicon bronze fasteners combine desirable features

Silicon bronze offers the highest conductivity in fasteners able to withstand high stresses. It resists corrosion, stays free from season cracking, too. It makes ideal fasteners for electrical use where tensile strength is important; or for corrosive environments.

One of the first to develop such fasteners, RB&W cold works them for tensile strength and for clean, well formed threads that don't seize. Oval bolts, hex bolts and nuts, and U bolts available. Specials can be developed.

RB&W FASTENERS—STRONG POINT OF ANY ASSEMBLY



*Week ended Oct. 26.

Business Is Good Despite Caution Mongers

IN TERMS of dollar volume, and, in many cases, physical volume, a lot of businessmen are going to enjoy one of their best years on record. But to hear them talk, you'd think that 1957 is a throwback to 1949 or 1954.

Much of their pessimism stems from a negative appraisal of performance. Many goals for 1957 were set with one thing in mind: Beat the bejabers out of 1956, just as 1955 records were smashed in 1956. The "ever onward, ever upward" concept leaves no room for second best.

Counter to Facts—During the last two weeks, STEEL has spot-checked the business expectations of key capital goods producers (Oct. 21, Page 42) and component suppliers (see Page 65). Generally, their shipments are better than they were in the third quarter and about on a par with those in last year's fourth quarter. Yet there is an amazing amount of apprehension among even the most successful businessmen this year.

The Facts—The latest facts and best estimates are these:

1. Monthly industrial production as measured by the Federal Reserve Board matched or bettered the year-ago marks through September. In the annual survey of economists' opinions conducted by F. W. Dodge Corp., New York, the median projection of 202 participants for the December index reading was 145 (1947-49 = 100), or a decline of only 2 percentage points. The economists expect a dip to 144 in 1958's first half and a rise to 146 by December, 1958.

2. Gross national product in the third quarter was at a record annual rate of $439 billion. The economists anticipate a leveling off at an annual rate of about $440 billion until the second quarter of next year, followed by a steady rise to $449 billion by the end of the year.

3. New plant and equipment expenditures this year will total

BAROMETERS OF BUSINESS

	PERIOD* LATEST	WEEK PRIOR	AGO YEAR
INDUSTRY			
Steel Ingot Production (1000 net tons)[2]	2,024[1]	2,052	2,493
Electric Power Distributed (million kw-hr)	11,700[1]	11,684	11,391
Bituminous Coal Output (1000 tons)	9,895[1]	9,910	10,534
Petroleum Production (daily avg—1000 bbl)	6,750[1]	6,747	6,998
Construction Volume (*ENR*—millions)	$359.6	$312.3	$550.5
Auto, Truck Output, U. S., Canada (*Ward's*)	130,797[1]	96,341	133,132
TRADE			
Freight Car Loadings (1000 cars)	720[1]	727	817
Business Failures (Dun & Bradstreet)	258	244	254
Currency in Circulation (millions)[3]	$31,129	$31,191	$30,864
Dept. Store Sales (changes from year ago)[3]	0%	−1%	−3%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$22,409	$21,799	$21,832
Federal Gross Debt (billions)	$274.4	$274.1	$275.6
Bond Volume, NYSE (millions)	$34.0	$24.1	$15.9
Stocks Sales, NYSE (thousands of shares)	20,804	13,158	7,848
Loans and Investments (billions)[4]	$87.3	$87.3	$86.1
U. S. Govt. Obligations Held (billions)[4]	$25.3	$25.3	$26.4
PRICES			
STEEL's Finished Steel Price Index[5]	239.15	239.15	225.58
STEEL's Nonferrous Metal Price Index[6]	207.1	207.4	254.1
All Commodities[7]	117.7	117.7	115.0
Commodities Other Than Farm & Foods[7]	125.6	125.7	123.0

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1957, 2,559,490; 1956, 2,461,893. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-1939=100. [6]1936-1939=100. [7]Bureau of Labor Statistics Index, 1947-1949=100.

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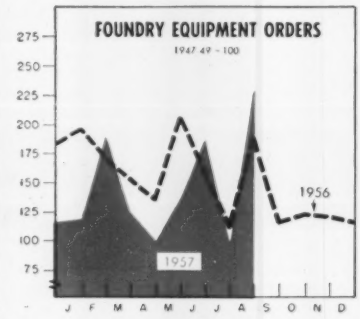
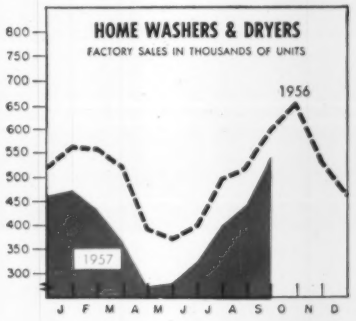
THE BUSINESS TREND



	1957	1956	1955
Jan.	117.9	195.6	81.0
Feb.	188.4	169.0	90.4
Mar.	127.0	152.7	163.6
Apr.	101.1	135.2	178.6
May	136.2	207.0	145.7
June	187.5	156.7	186.8
July	98.6	110.3	213.4
Aug.	231.3	188.3	134.0
Sept.	....	114.7	156.7
Oct.	....	122.2	108.6
Nov.	....	121.0	154.4
Dec.	....	115.6	183.9
Avg.	....	149.0	150.0

Foundry Equipment Mfrs. Assn.
Charts copyright, 1957, STEEL.



	Washers		Dryers	
	1957	1956	1957	1956
Jan.	331.314	393.717	144.621	166.243
Feb.	319.580	405.631	114.517	148.522
Mar.	286.205	405.744	83.668	113.031
Apr.	230.675	324.238	42.850	64.923
May	254.195	315.249	31.572	55.330
June	282.289	340.235	46.783	58.441
July	335.139	380.172	70.011	117.548
Aug.	329.046	373.925	116.601	144.537
Sept.	384.299	402.631	164.468	192.724
Oct.	.....	449.409	.....	206.929
Nov.	.....	357.935	.....	170.529
Dec.	.....	298.368	.....	162.953
Totals	4,447,254		1,601,710	

American Home Laundry Mfrs. Assn.

about $37 billion. The economists' median forecast for 1958 was a mild dip to $36 billion—second best, but still good.

4. New construction is rolling along at a $47 billion annual clip, and the Dodge survey indicates it will continue at this rate through 1957 and 1958.

5. Personal consumption expenditures are running at a record $278 billion, and the consensus is that the second half rate will be $280 billion. Next year will see a $285 billion rate. It figures: Net spendable earnings are continuing to rise monthly. Latest figures from the Bureau of Labor Statistics (for September) showed that the takehome pay of a worker with three dependents rose to $75.63 a week, 32 cents higher than it was in August.

That gain more than offset the slight rise in consumer prices to 121.1 per cent of the 1947-49 base in September. Most economists feel the rise in the cost of living is losing steam. Coupled with built-in wage hikes, this leads to the conclusion that the consumers' buying position will strengthen within the next year.

In the face of such facts and projections, it's hard to justify the prevailing wait-and-see attitude. You can't measure the effects of psychology.

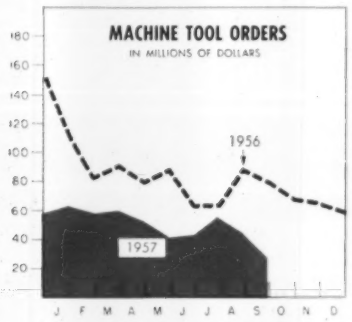
PAs Lose Optimism

You can detect some caution in the latest report of the National Association of Purchasing Agents. New orders, production, and employment in October were down from September levels. And purchasing executives are reluctant to commit themselves too far into the future, especially in regard to capital goods. One of the bright spots of the report is the feeling that commodity prices have stabilized. Exception: Some metal prices continue to weaken.

Index Continues Climb

STEEL's industrial production index continued to edge up during the week ended Oct. 26 despite downturns in steel output and freight car loadings. It reached 149 (1947-49 = 100), 9 points above the low point of a month ago. The buildup in auto production and a slight rise in the output of electricity overbalanced the weaknesses.

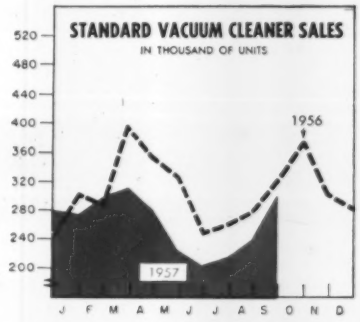
Steel operations are the big dis-



(Thousands of dollars)

	New Orders		Shipments	
	1957	1956	1957	1956
Jan.	63,250	109,550	76,550	54,600
Feb.	58,200	81,300	77,700	64,600
Mar.	58,900	89,500	89,100	74,150
Apr.	51,300	79,300	87,800	71,800
May	41,400	87,100	7[illegible],500	76,800
June	43,100	61,850	82,950	76,250
July	55,500	61,900	58,700	65,150
Aug.	44,500	87,500	63,200	75,100
Sept.	28,250*	78,450	64,600*	71,100
Oct.	.....	66,100	.....	89,750
Nov.	.....	64,250	.....	81,700
Dec.	.....	57,200	.....	85,150
Totals	.....	924,000	.....	886,150

*Preliminary.
National Machine Tool Builders' Assn.



	1957	1956	1955
Jan.	276,738	302,203	248,941
Feb.	300,887	286,386	261,183
Mar.	312,746	395,686	356,444
Apr.	281,627	352,873	241,870
May	231,246	326,008	255,941
June	207,286	248,326	239,728
July	218,276	259,774	206,758
Aug.	241,218	276,932	252,691
Sept.	302,869	320,278	306,507
Oct.	.....	371,998	349,654
Nov.	.....	300,381	307,267
Dec.	.....	281,025	243,457
Totals ...	.....	3,721,870	3,270,441

Vacuum Cleaners Mfrs.' Assn.

appointment in the production picture. Despite the increased consumption of its No. 1 customer—motordom—the industry has seen its operating rate slide from 2,115,000 net tons for ingots and castings during the week ended Oct. 6 to a 15-week low of 2,024,000 tons last week. The industry had been expected to operate at about 85 per cent of capacity at this time, but the current rate is only 79 to 80 per cent.

Industry Reports

• Orders for industrial furnaces in the first nine months of this year total $45.6 million, down 25 per cent from the corresponding figure for 1956, reports the Industrial Heating Equipment Association Inc., Washington. September orders amounted to $2,337,000, about 24 per cent under the September, 1956, figure. Orders for induction and dielectric heating equipment are down 15 per cent from the year-ago total.

• Class I railroads installed 99 locomotive units in September, bringing the nine-month total to 1019, says the Association of American Railroads, Washington. This compares with 1125 units for the corresponding 1956 period. The order backlog on Oct. 1 was 296 units, compared with 737 in 1956.

• For the first time since last February, in September structural steel fabricators failed to ship over 300,000 tons of steel a month, says the American Institute of Steel Construction Inc., New York. Shipment of 294,719 tons was still 22 per cent above the year-ago figure, however, and the nine-month total remains 17 per cent better than the corresponding 1956 level. Bookings in September were up from August's, but the cumulative total is 23 per cent off the 1956 pace.

• Manufacturers of metal furniture continue to show improvement in shipments and orders. September orders rose 3 per cent above the year-ago position while shipments advanced 5 per cent, says the National Association of Furniture Manufacturers Inc., Chicago.

• Members of the American Supply & Machinery Manufacturers' Association are having their best year on record. The association's new order index for September rose to 203 (July, 1948 = 100), bringing the nine-month average to 205.3. The monthly average last year was 201.8.

Tensile anyone?

Somers is game

If tensile strength of thin strip is a critical requirement of your present or anticipated production, Somers Brass will be glad to serve.

Nearly 50 years of experience with thin gauge brass, nickel, copper and alloys, plus complete laboratory facilities are available, without cost or obligation to you, to solve your problems in tensile strength, dimensions, temper and other properties.

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Spur gear

Index plate

Retaining ring

How one machine hardens them all *without distortion*

You can quench any part quickly from a hot, plastic state without warpage or distortion when you work with Gleason Quenching Presses.

Since no straightening operation is necessary after hardening you save time and make a definite advance in quality control. Experience shows there is much less residual stress in non-straightened parts.

A button is pressed and the automatic quenching cycle is started. The lower die is swung back into the quenching position and the upper die descends rapidly, aligning the part while it is still in the plastic state.

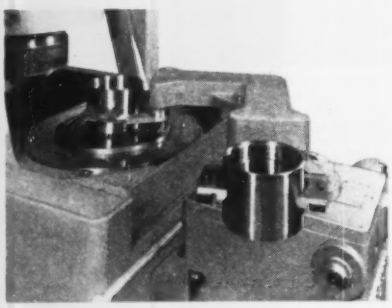
Carefully controlled metallurgically correct oil circulation cools and hardens the part uniformly to preset rates.

The two dies align the part throughout cooling, allowing the part its normal contraction but keeping it true. After the quench, the part is swung out for removal.

As shown in the photograph at the left, Gleason Quenching Presses can be arranged with a completely automatic load and unload unit.

You can harden *any* part, regardless of shape, with this method. There are three presses accommodating parts up to 36″ diameter. Still another Gleason Press automatically hardens and straightens shafts and similar parts up to 4″ in diameter and 40″ long.

Write for literature on the presses. And for recommendations on the press and dies that best fit your products, send us blueprints.



The Gleason Nos. 16 and 26 Quenching Presses can be arranged with the load and unload unit. This unit makes it possible to speed production and reduce labor requirements.

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66

ALVIN J. JONES
Motch & Merryweather eng.-dir.

REESE LLOYD
Kelsey-Hayes v. p.

DAVID T. MORGENTHALER
president, Foundry Services

GEORGE M. BRYDON
gen. mgr., Butterfield Div.

Alvin J. Jones was made director of engineering at **Motch & Merryweather Machinery Co.**, Cleveland. He will direct all engineering activities at Cleveland as well as at the Avey Div., Cincinnati. Mr. Jones was chief engineer with Landis Tool Co.

Reese Lloyd was appointed vice president, **Kelsey-Hayes Co.**, Detroit. He continues as president of the newly formed Heintz Div., Philadelphia.

Donald W. Douglas Jr. was named president, **Douglas Aircraft Co. Inc.**, Santa Monica, Calif. He succeeds his father who retains his post as chairman. **Frederick W. Conant**, senior vice president, was named to the new post of vice chairman.

Dr. A. M. Aksoy was made manager of **Crucible Steel Co. of America's** new applied research laboratory, situated at the Sanderson-Halcomb Works in Syracuse, N. Y. He was chief metallurgist for Vacuum Metals Corp., an operating division of the works.

Gerald C. Saltarelli was elected to the new post of senior vice president, **Houdaille Industries Inc.**, Buffalo, with executive responsibilities for all Houdaille manufacturing plants and units. He was vice president-operations.

Charles E. Nelson Jr. was named executive vice president, **Waukesha Motor Co.**, Waukesha, Wis. **Newton H. Willis** was named vice president-engineering.

David T. Morgenthaler was elected president of **Foundry Services Inc.**, Columbus, Ohio, to succeed **Eric Weiss**, who continues as chairman. Mr. Morgenthaler was vice president of marketing with Delavan Mfg. Co.

T. Laurence Strimple was elected president, **National Acme Co.**, Cleveland. He succeeds **Fred H. Chapin**, who continues to serve as board chairman. Mr. Strimple was secretary and general counsel.

Ralph W. Palmer was named technical sales manager, **John S. Barnes Corp.**, Rockford, Ill. He continues as assistant chief engineer.

Harlan E. Eastman was made purchasing agent, **Helipot Div.**, Beckman Instruments Inc., with headquarters at Newport Beach, Calif.

Elbert G. Bellows was elected a vice president, **W. L. Maxson Corp.**, New York. He was assistant vice president, contracts division. **William P. McNally** was made sales manager; **Joseph W. Stehn**, assistant sales manager. Mr. McNally succeeds **John W. Bjorkman**, resigned.

C. Edwin Ponkey was elected president of **Dallas Tank Co. Inc.**, Dallas. He joined the firm in August as general manager and assistant to the president. **Henri Jennings** was made vice president of liquefied petroleum gas sales; **Allen Peairs**, vice president of custom sales. **George Cook** joined the company as factory manager of the Dallas plant.

George M. Brydon was appointed general manager, **Butterfield Div.**, Union Twist Drill Co., at Derby Line, Vt. He succeeds **Martin C. Butters**, resigned. He was director of manufacturing for all divisions of John Bertram & Sons Co. Ltd., Dundas, Ont.

Robert E. Fromson was named works manager, **Bryant Electric Co.**, Bridgeport, Conn., subsidiary of Westinghouse Electric Corp. He is responsible for manufacturing, production, and maintenance activities of the Bridgeport and Danielson, Conn., plants.

Edward J. Mulroony was made regional manager, **Baker-Raulang Co.**, subsidiary of Otis Elevator Co. With headquarters in New York, his area extends from Maine to Virginia.

Edwin Hodge Jr. was elected chairman, **Westinghouse Air Brake Co.**, Wilmerding, Pa. He continues as president and chairman of Pittsburgh Forgings Co. At Westinghouse Air Brake, he succeeds **Edward O. Boshell**, resigned.

John T. Castles was made sales manager for the silicone products department of **General Electric Co.**, Waterford, N. Y., succeeding **Jerome T. Coe**, who becomes the department's marketing manager. Mr. Castles was manager of rubber market development.

Charles A. Schulte was made manager of **Vanadium Corp. of America's** new Vancoram, Ohio, plant. **Albert J. Primosic** was made man-

GORDON SWARDENSKI

CHARLES E. VERKLER

Caterpillar Tractor plant changes

WILLIAM STAECKER

ALFRED DRAIN

E. W. Bliss engineer promotions

ager of the Niagara Falls, N. Y., plant to succeed Mr. Schulte.

At the Peoria, Ill., plant of **Caterpillar Tractor Co.**, **Gordon Swardenski** was made assistant plant manager and is succeeded as manufacturing manager by **Charles E. Verkler.** **Robert E. Gilmore** was named assistant manufacturing manager. **Thomas H. Spencer** heads a new quality control department. **A. L. Jerome** succeeds Mr. Spencer as plant metallurgist.

Jerry Cummins was made general sales manager, **Atlas Precision Products Co.**, division of Prudential Industries Inc., Philadelphia.

Mathias A. Gatzweiler was made production control manager, Jackson Div., **Aeroquip Corp.**, Jackson, Mich. He was production control supervisor at the Elbeeco Div., also in Jackson.

William A. Kerr was made general sales manager, electronics and instrumentation division, **Baldwin-Lima-Hamilton Corp.**, in Waltham, Mass. He was vice president-general manager, nuclear divisions, Tracerlab Inc.

Reynolds Aluminum Sales Co., Louisville, appointed three vice presidents: **William T. Ingram**, general sales manager for Reynolds Metals Co.; and **Paul Murphy** and **Charles M. Mapes**, general managers for the company's packaging and consumer market sales divisions, respectively.

John R. Davis was appointed southeastern representative for **Osborn Mfg. Co.'s** machine division. He is at Chattanooga, Tenn.

At **E. W. Bliss Co.**, Canton, Ohio, **William Staecker**, former chief engineer, Canton division, joins the general office staff as assistant manager of engineering for the press division. **Alfred Drain** succeeds Mr. Staecker.

John E. Blomquist was made vice president-general manager of the Great Lakes sales region for **Reynolds Aluminum Sales Co.** He is at Detroit. He previously was general sales manager, industrial fabricating division, in Louisville. **DuPont Yager**, former Detroit regional manager, was named vice president-automotive sales.

James Armour was made sales manager, cutting tool division, **Brubaker Tool Corp.**, Millersburg, Pa. He was assistant sales manager of the division, and is succeeded by **Mark E. Cooper.**

A. H. Kappenberger fills the new post of assistant to the president, **Peerless Steel Equipment Co.**, Philadelphia.

Sylvan J. Cromer was appointed vice president-engineering, **Union Carbide Nuclear Co.**, division of Union Carbide Corp., New York.

Charles J. Brown was made sales manager, **Cuban American Nickel Co.**, subsidiary, Freeport Sulphur Co., New York.

J. George Miles was made assistant to the vice president-**Sheffield Div.**, Armco Steel Corp., at Houston.

Fred H. Ueckermann was named Chicago district manager, wire rope division, **John A. Roebling's Sons Corp.**, succeeding **Carl H. Walles**, resigned. Mr. Ueckermann headed the Atlanta district office, and is replaced by **Harry L. Truitt Jr.**

Edward H. Durkee was elected secretary-treasurer, **Great American Industries Inc.**, Elyria, Ohio.

N. Kerry Patterson and **Paul E. Richard** joined the sales staff of the Los Angeles office of **L. B. Foster Co.** Mr. Patterson specializes in highway products sales. Mr. Richard handles tubular product sales.

Ralph R. Wyckoff was made sales promotion manager, **A. J. Gerrard & Co.**, Melrose Park, Ill.

George W. Edick was made sales manager, domestic division, **Cooper - Bessemer Corp.**, Mt. Vernon, Ohio.

Russell S. Rockafellow joined **Raytheon Mfg. Co.**, Waltham, Mass., as manager of industrial engineering. He was director of production engineering, Chrysler Corp.

Alan E. Bodycombe was appointed to the Michigan sales engineering staff of **Mechanical Handling Systems Inc.**, Detroit.

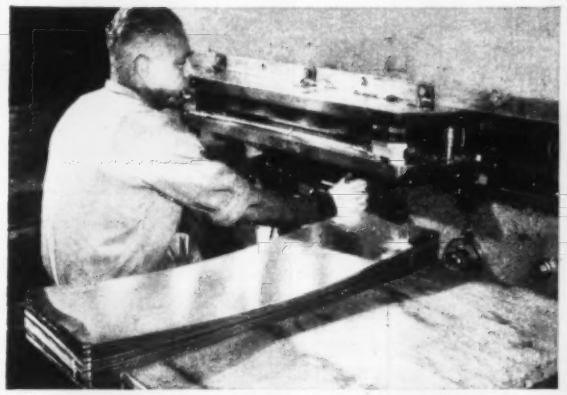
B. H. Puerner, assistant manager, processing machinery department, **Allis-Chalmers Mfg. Co.**, Milwaukee, was named manager of special projects for Allis-Chalmers International.

H. F. Robertson was made technical director of **Union Carbide Development Co.**, New York, division of Union Carbide Corp.

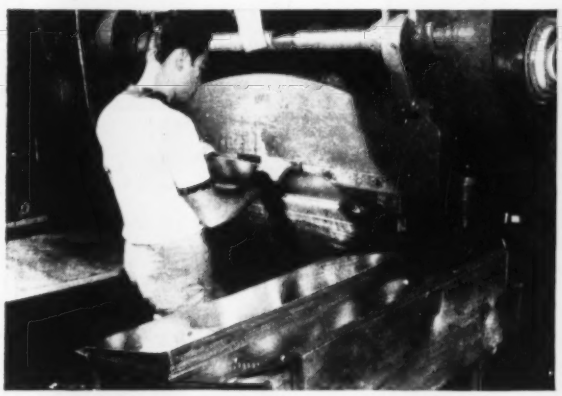
Jerome McInnes was made engi-

Production Takes A Short-Cut

With Pre-Plated NICKELOID METALS

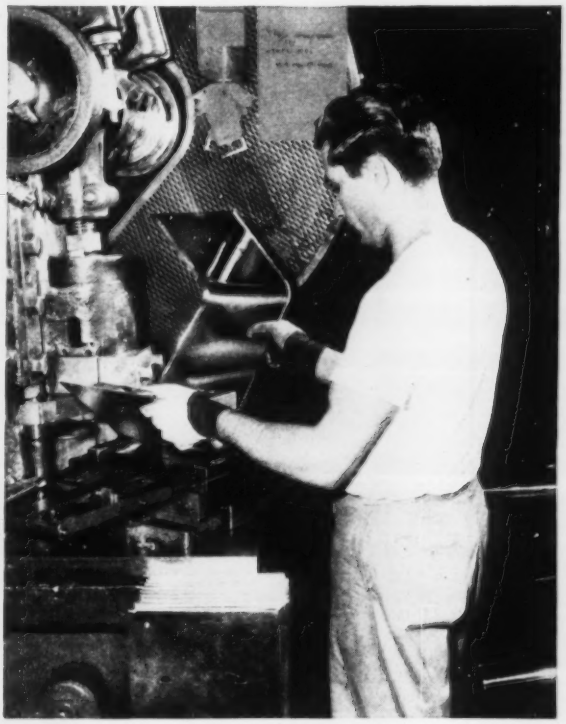


Sheet of Nickeloid chrome-steel that will be used for breadbox is blanked, with punch-out perforations for ventilation and indented shelf supports. Uniform pre-plated finish reduces rejects.



Edges of Nickeloid chrome-steel sheet are turned up ½" in forming press. Nickeloid is easily worked with standard methods.

Breadbox body frame is spot welded to the preformed bottom and back pieces, with no visible oxidation. Parts then move to assembly.



Two bends are made on press to give the breadbox its rectangular shape. Operation causes no marring of surface or dulling of finish.

No Cleaning or Post-Plating — Easily Worked With Standard Production Methods

No cleaning solutions, plating tanks or polishing wheels on the production line at Lincoln Metal Products Co., Brooklyn, N.Y., manufacturer of fine pantryware. Lincoln eliminates these costly intermediate steps by using Nickeloid pre-plated chrome-steel and copper-steel. These versatile design materials speed trouble-free production, reduce rejects, prolong tool life. They are readily worked with standard production methods, as shown here. Parts move from fabrication — to assembly — to packing, with no dulling or marring of the pre-plated finish, since Mar-Not protective covering is used. No cleaning, plating, polishing is needed. Nickeloid Metals are available in pre-plated finishes of chrome, nickel, copper or brass on steel, zinc, copper, brass and aluminum. Sheets, strips, coils — a wide range of finishes and patterns.

Write For Free Literature

NICKELOID METALS SINCE 1898

AMERICAN NICKELOID COMPANY

Peru 1, Illinois

EDWARD A. BALEY
Park Drop Forge sales mgr.

JOHN J. LOHRMAN
RB&W distribution

JAMES A. KYFFIN
Norgren dir.-purchases

EDWARD F. BAUMAN
Federal-Mogul-Bower post

JOSEPH GRILLO
joins Industrial Control

HENRY C. FERNSTROM
Barrett-Cravens v. p.

neering manager for **Randolph Iron & Steel Corp.**, San Diego, Calif.

Edward F. Bauman was promoted to director of purchasing staff activities for **Federal-Mogul-Bower Bearings Inc.**, Detroit. He was director-purchases for Federal-Mogul Div. He now heads a new corporate staff division responsible for developing and supervising general purchasing policies and coordinating purchasing at the company's six line divisions.

James E. Rogerson heads the newly organized distribution services division of **American Steel & Wire Div.**, U. S. Steel Corp., Cleveland. He was assistant director-production planning.

George Duvall was named vice president-general manager, **Striker & Boyson Mfg. Co.**, San Diego, Calif.

Ernest C. Hungate was named industrial air conditioning product specialist for the machinery and systems division of **Carrier Corp.**, Syracuse, N. Y.

Joseph Grillo joined **Industrial Control Products Inc.**, Caldwell, N. J., as vice president-engineering. He was with the reactor development division of Combustion Engineering Co.

Barrett-Cravens Co., Northbrook, Ill., appointed **Henry C. Fernstrom** vice president. He has been chief engineer and director of sales. **Kenneth E. Forster** was made general sales manager; **Frederick H. Huntoon**, plant superintendent; **Wilbur M. Antal**, eastern sales manager, Hillside, N. J.

Roger N. Burgess was made manager of field sales; **H. D. Lewis**, Detroit district manager for **Howell Electric Motors Co.**, Howell, Mich.

George A. Fairweather was appointed factory manager of the two defense plants of **Chrysler Corp.**, at Eynon, Pa., and Newark, Del.

R. C. Mahoney was named chief engineer at **A & E Engineering Co. Inc.**, San Diego, Calif.

Edward A. Baley was made sales manager and assistant general manager, **Park Drop Forge Co.**, Cleveland. **George A. Bricmont** was made assistant general sales manager.

John J. Lohrman joined **Russell, Burdsall & Ward Bolt & Nut Co.**, Port Chester, N. Y., to head a new department of distribution.

James A. Kyffin was made director of purchases and traffic for **C. A. Norgren Co.**, Englewood, Colo. He was a buyer in the purchasing department.

P. H. Richey, executive vice president of Wagner Bros. Inc., Detroit, was named president and treasurer of a newly acquired subsidiary, **Automatic Molding Machine Co.**, Los Angeles. Other officers of the California company are: **F. M. Mansfield**, vice president-sales; **Bruno Leonelli**, vice president; **Irvin Tochner**, vice president-operations.

George A. Waterman joined **Olin Mathieson Chemical Corp.**, New York, as director of product sales and engineering for Olin Aluminum. He was manager, extrusion sales, Kaiser Aluminum & Chemical Sales Inc.

OBITUARIES...

E. Donaldson Clapp, 75, president, **E. D. Clapp Mfg. Co.**, Auburn, N. Y., died Oct. 22.

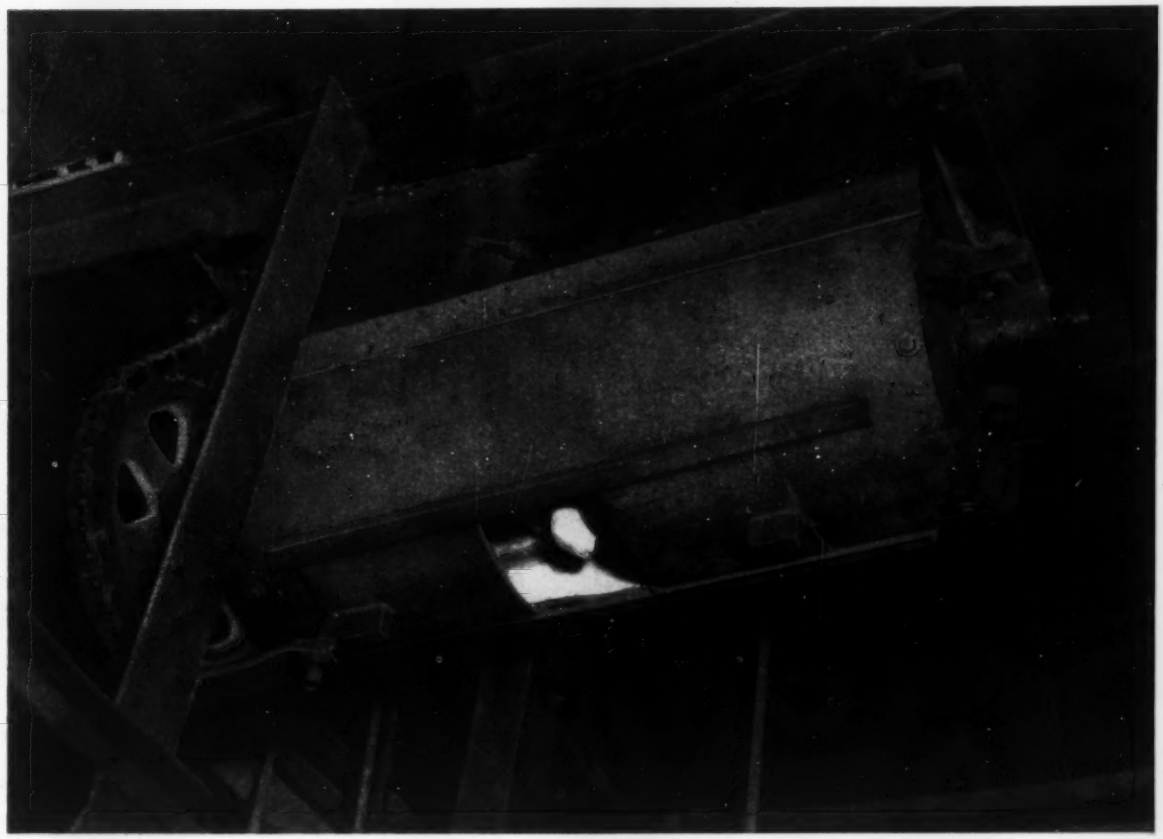
E. B. Hill, 78, retired vice president, **Bethlehem Pacific Coast Steel Corp.**, died Oct. 13 in Woodside, Calif.

William Barnacal, 74, retired works manager, **Canadian General Electric Co. Ltd.**, died Oct. 16 in Toronto, Ont.

Francis Riley, 67, president and founder, **Riley Power Equipment Co.**, Milwaukee, died Oct. 14.

W. B. Renois, assistant to the president of **A. J. Gerrard & Co.**, Melrose Park, Ill., died Oct. 11.

Paul D. Merica, 68, retired president, **International Nickel Co. of Canada Ltd.**, died Oct. 20 in Tarrytown, N. Y.



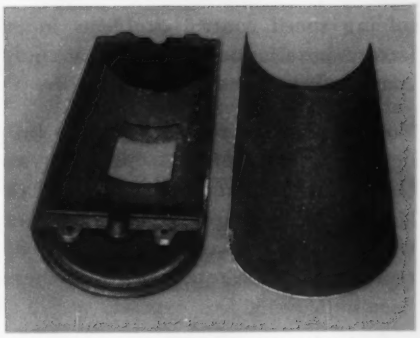
LOCK JOINT PIPE COMPANY of NEWINGTON, CONN., REPORTS:

6 times longer service life with JALLOY steel plate

Mild steel plate at bottom of this cement agitator had to be replaced every 4 weeks. The ¼" Jalloy plate, now used, lasts from 22 to 24 weeks. The Lock Joint Pipe Company has a resultant saving in reduced downtime and steel cost.

Heat treated Jalloy steel will also extend the life of your products that are subjected to rigorous impact and abrasive conditions. Increased product life can reduce your downtime and maintenance costs. Jalloy is available in forms you require (hot rolled sheets, plates, bars, small shapes and structurals). It can be purchased in three different grades to meet requirements of formability, hardness and wear resistance.

Your local distributor can supply you with details on Jalloy grades, or you can write to Jones & Laughlin Steel Corporation, 3 Gateway Center, Pittsburgh 30, Pennsylvania.



This Jalloy plate is formed cold into a half circle 14 inches across the open end. Length of the agitator bottom plate is 30 inches. Dick Griffith, superintendent at the Newington, Conn., plant, reports that Jalloy steel plate stands up under the tough abrasive action of the cement dry mix and the pounding of the 16 agitator teeth. Material for this installation is supplied by Brown-Wales Co., Cambridge, Mass.

JL STEEL **Jones & Laughlin**

. . . a great name in steel

Speed Control Problems?

Let the Dynamatic Man Help You . . . He's an Expert!

More than likely the Dynamatic representative in your locality has had experience with a speed control problem about the same as yours. At any rate, he'll be glad to sit down with you and help work out the most practical and economical solution.

Dynamatic Eddy-Current Equipment—Drives, Brakes, Couplings—is solving speed control problems in every major industry, both in factory installations and on new equipment. Almost certainly some combination of these units will solve YOUR problem.

Your Dynamatic representative is fully qualified to make an intelligent appraisal of your problem, and suggest an application of Dynamatic Equipment that will do the most effective job for you. He has the background and experience to approach your problem with complete understanding. Why not call or wire the Dynamatic representative nearest you today—there's no obligation.

Illustrated Literature Describing Dynamatic Speed Control Equipment is Yours for the Asking

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BUFFALO, NEW YORK
H. H. Cardozo, 5469 Main Street

BUTTE, MONTANA
G. M. Wallace & Company, Box 208

CHARLESTON, WEST VIRGINIA
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217 West Morehead Street

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Gregg & Spohn, 1416 Bonnell Ave.

CLEVELAND, OHIO
Eaton Manufacturing Company
13600 Kuhlman Ave.

COLUMBUS, OHIO
Gregg & Spohn, 1738 Fifth Ave.

DALLAS, TEXAS
Lynn Elliott Company
1008 Fidelity Union Life Bldg.

DENVER, COLORADO
G. M. Wallace & Company
324 Denham Building

DETROIT, MICHIGAN
Eaton Manufacturing Company
10208 West McNichols Road

(Continued on following page)

(Advertisement)

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(Continued)

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Henry Electric Company
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GRAND RAPIDS, MICHIGAN
E. B. Dewey Company
314 Straight Ave., S.W.

HOUSTON, TEXAS
Lynn Elliott Company
371 M & M Building

INDIANAPOLIS, INDIANA
Gregg & Spohn, 5416 College Ave.

KALAMAZOO, MICHIGAN
E. B. Dewey Company
2519 Lake Street

KANSAS CITY, MISSOURI
Boyd Goodhart & Associates
Merchandise Mart Bldg., 2201 Grand Ave.

LOUISVILLE, KENTUCKY
Cardinal Carryor Co., Inc.
930 East Mason Street

MEMPHIS, TENNESSEE
Tom Jones, Mfr's Rep.
651 South Cooper Street

MIAMI, FLORIDA
The Gearhart Company
9731 Dominican Drive, Cutler Ridge

MILWAUKEE, WISCONSIN
Albert F. Korf & Company
3545 North Maryland Ave.

MINNEAPOLIS, MINNESOTA
Bemis Johnson Company
1645 Hennepin Ave.

MONTREAL, QUEBEC, CANADA
George Rumble Company, Ltd.
690 St. Paul St. West

NEW ORLEANS, LOUISIANA
Mid-South Sales Company
4424-B Earhart Boulevard

NEW YORK, NEW YORK
Gregg & Associates, U. S. Route 47,
Box 329, Caldwell Twp., New Jersey

NORTHBORO, MASSACHUSETTS
Machinery Electrification, Inc.
35 Hudson Street

PASADENA, CALIFORNIA
Shaw Engineering Sales Co., Box 590

PHILADELPHIA, PENNSYLVANIA
Eaton Manufacturing Company
5921 North Broad Street

PITTSBURGH, PENNSYLVANIA
J. A. Malady Company
4135 Brownsville Road

PORTLAND, OREGON
Donal Company, Box 7013

RICHMOND, VIRGINIA
Herbert J. Baer, 304 East Main Street

ROCHESTER, NEW YORK
H. H. Cardozo
414 Reynolds Arcade Bldg.

SAGINAW, MICHIGAN
Henry Electric Company
1716 South Jefferson

ST. LOUIS, MISSOURI
A. M. McIntyre, 8226 Buchanan

SALT LAKE CITY, UTAH
G. M. Wallace & Company
Continental Bank Bldg.

SAN FRANCISCO, CALIFORNIA
Monarch Corporation
55 New Montgomery Street

SAN LEANDRO, CALIFORNIA
Monarch Corporation, Supply Division

SANTA CLARA, CALIFORNIA
Monarch Corporation
2455 The Alameda

SANTURCE, PUERTO RICO
Ramon I. Gil, Box 9182
Santurce Station

SEATTLE, WASHINGTON
Caskey Engineering Co.
2200 First Ave. South

STONERSVILLE, PENNSYLVANIA
E. F. Le Noir

TARIFFVILLE, CONNECTICUT
Gregg & Associates, 5 Fairfield Road

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George Rumble Company, Ltd.
Terminal Building

VANCOUVER, BRITISH COLUMBIA, CANADA
Progressive Supplies Ltd.
360 West First Ave.

WASHINGTON, D.C.
Commercial Engineering Co.
1627 K Street N.W.

To Make Line Pipe

Steel and aluminum products up to 14 in. will be made by Aluminum Tubing Co. in Florida

ALUMINUM TUBING CO., Jacksonville, Fla., will install a mill for the manufacture of steel, stainless steel, and aluminum pipe and tubing. (Sizes: 4.5 to 14 in.) It is scheduled to be in operation in March, 1958, says H. H. McCarl, general manager.

Steel pipe will be welded by the electrical resistance process, using equipment manufactured by McKay Machine Co., Youngstown. Stainless steel and aluminum pipe will be welded by the inert gas shielded, tungsten arc process and the high frequency resistance process.

Steel pipe will be produced for oil and gas gathering, transmission and distribution lines, water and oil well casing, municipal and project water systems, and construction piping. Aluminum pipe will be manufactured primarily for the irrigation industry. Stainless steel pipe and tubing will be produced for the chemical processing and related industries.

The company says it produces about 10 per cent of the aluminum irrigation tubing made in the U. S.

Will Offer Lipe Bar Feed

Brown & Sharpe Mfg. Co., Providence, R. I., will sell an automatic, magazine loading, bar feed manufactured by Lipe-Rollway Corp., Syracuse, N. Y., for installation on Brown & Sharpe single-spindle automatic and hand screw machines.

Huge Press in Operation

Harvey Aluminum, Torrance, Calif., has placed in operation an extrusion press capable of exerting a force of 12,000 tons. This press and a companion 8000-ton press at the Harvey mill are part of the Air Force heavy press program. The 12,000-ton press has an over-all length of 300 ft and weighs 4 million lb. It can extrude aluminum sections from ingots 32 in. in diameter and 75 in. long. Supporting facilities include vertical heat-treat furnaces as high as 110 ft, two large stretch-straighteners of 1.5-million and 3-million lb capacity, and an array of furnaces, heaters, and casting equipment.

Century Changes Name

Century Engineers Inc., Burbank, Calif., is changing its name to Royal Industries Inc. Century Electronics & Mfg. Co. will operate as a subsidiary.

GE Installs Furnace

General Electric Co. has installed a 108-ft roller-hearth furnace as part of a new automated production line for its Small AC Motor & Generator Dept. at Schenectady, N. Y. The furnace, designed by GE's Industrial Heating Dept., Shelbyville, Ind., anneals both the stator punchings and weld in one pass. It anneals up to 3000 lb of rotor and stator cores in one hour.

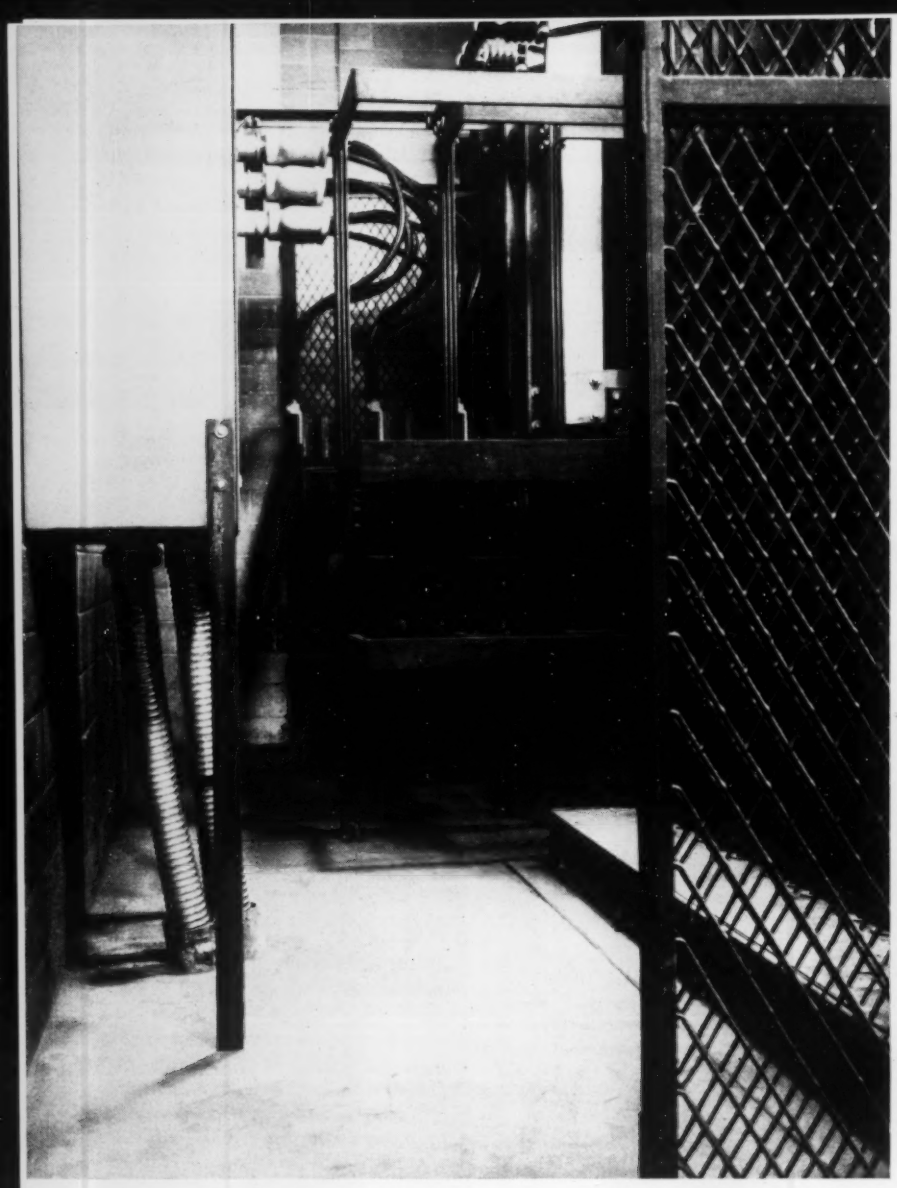
Sylvania Renames Division

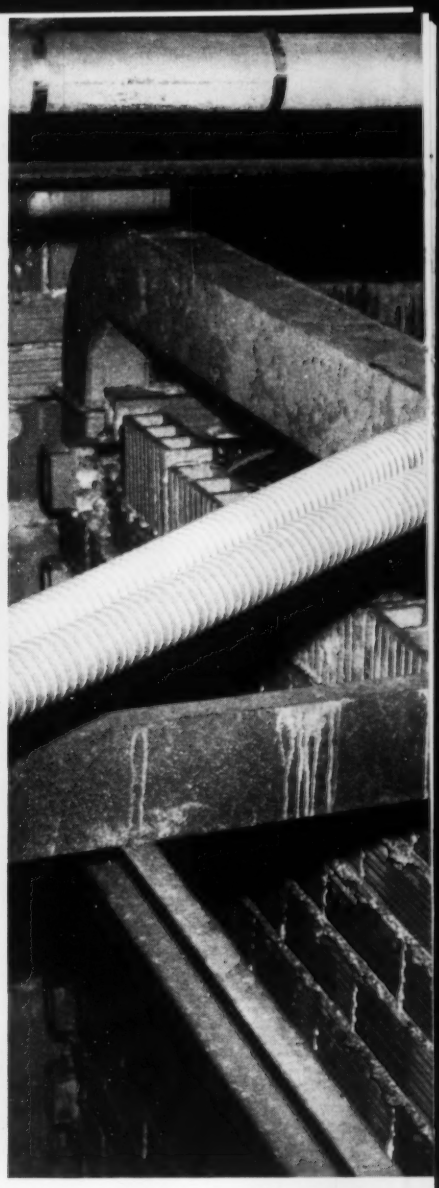
Sylvania Electric Products Inc.'s Tungsten & Chemical Div., Towanda, Pa., changed its name to Chemical & Metallurgical Div. Sylvania's activities in the fields of chemistry and metallurgy include the production of tungsten, molybdenum, germanium and silicon semiconductor materials, phosphors, plated fine wires, and special chemicals. At present, the division produces almost every type high purity chemical and metal material used by the electronics industry, as well as materials for the high temperature alloy metals industry. A 50,000 sq-ft research and development laboratory will be placed in operation soon.

Forms Tool & Mfg. Div.

A. O. Smith Corp., Milwaukee, has enlarged and given divisional status to its Milwaukee plant tooling facilities. Tool & Mfg. Div. manager is Elmer A. Widerborg, who will report to Fred Mackey, vice president-manufacturing. The firm is a fabricator of automobile frames and suspension system

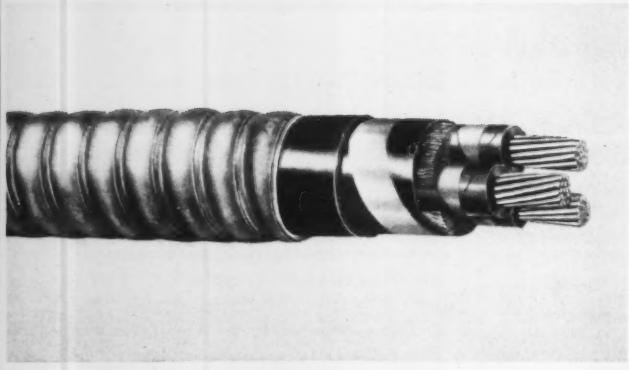
(*Please turn to Page* 96)





For air conditioning: Three conductor, 500 Mcm, 37 wire, $\frac{6}{64}$" varnished-cambric insulated Anaconda Duralox Cable was quickly, easily installed in older building

PROBLEM: Installing new circuits in old building

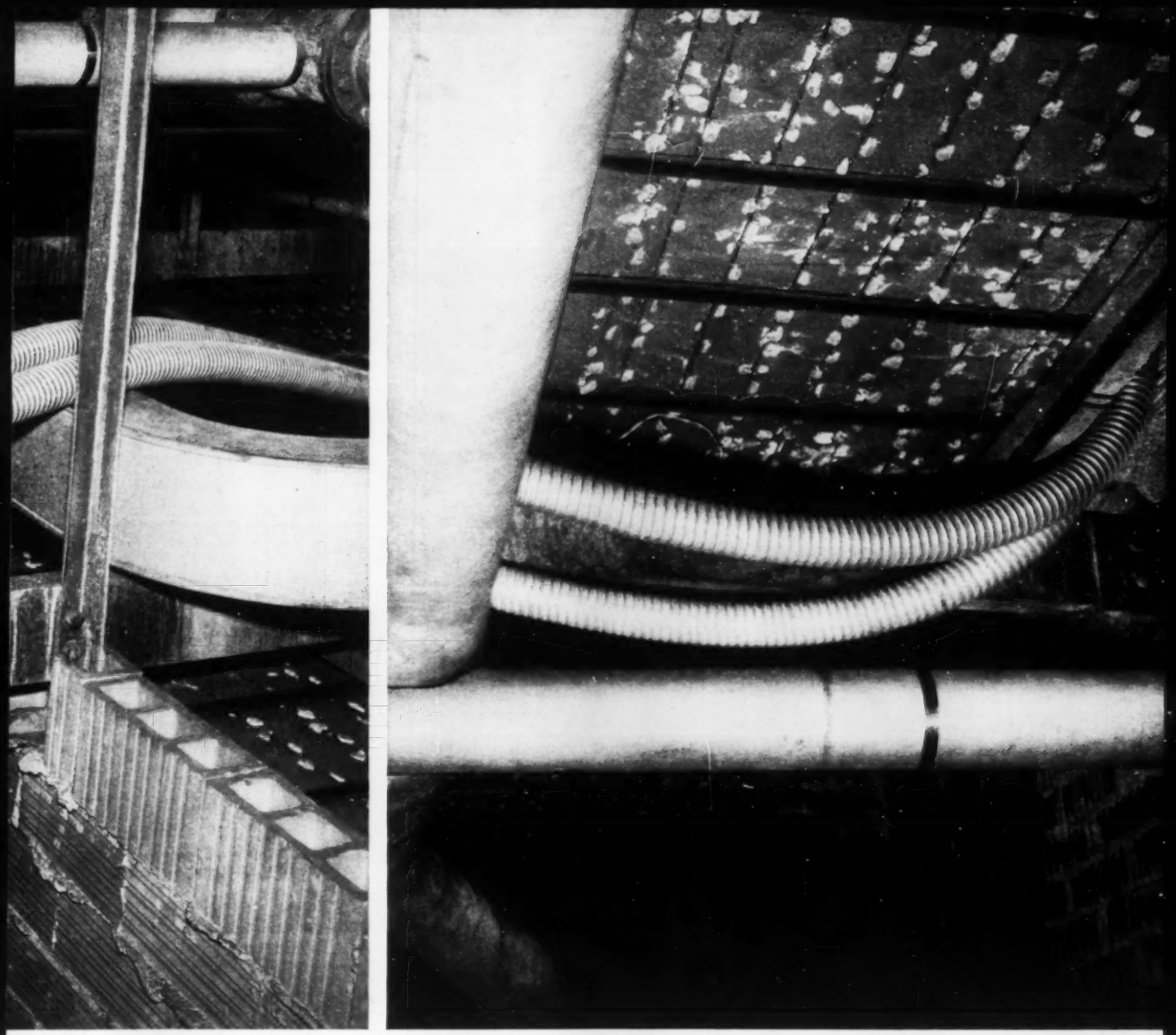


Anaconda Duralox Interlocked-armor Cable.

Installing new circuits in an old building – whether for air conditioning, as the case here, or for new machinery or new load centers – can be tough and costly. You either have to go around existing obstructions, a laborious job with rigid conduit, or remove them.

The ideal solution is Anaconda Duralox Interlocked-armor Cable.

Because it is flexible, Duralox Cable is quick, economical to install – indoors or out – with simple supporting devices. It trains easily around corners, columns and other obstructions in *long, unbroken*



to handle new load. Cable runs from breaker box in west wing (left) through loft of roof (center) to side wall of building and down wall (right) to breaker box on lower floors.

SOLUTION: Duralox Interlocked-armor Cable

or: *How to do a hard job the easy (and low-cost) way*

runs. Circuits are easy to relocate . . . always accessible. Duralox's interlocked metal-tape armor affords excellent protection against mechanical damage.

Anaconda Interlocked-armor Cable is available in sizes No. 6 Awg to 750 Mcm — copper or aluminum conductors — up to 15 Kv. Underwriters' approved for 600 volts and 5000 volts. With rubber, plastic, or varnished-cambric insulation.

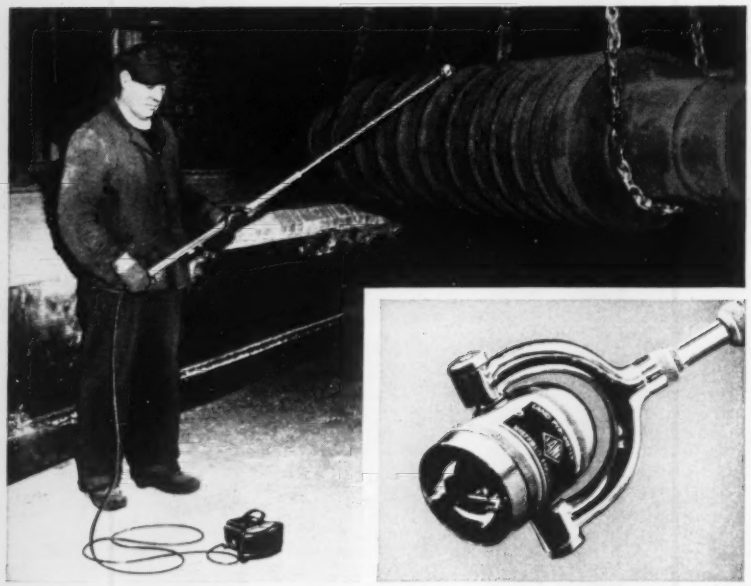
NEW BULLETIN DM 5606 on Anaconda Duralox Cable gives you full information. Write for your copy today. Anaconda Wire & Cable Company, 25 Broadway, New York 4, New York.

57406

ASK THE MAN FROM **ANACONDA®**

FOR **INTERLOCKED-ARMOR CABLE**

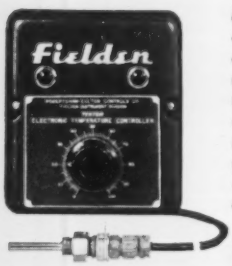
Now Check Surface Temperatures to ±0.5% in Only 5 Seconds



New from Fielden, the Land Portable Pyrometer provides direct readings . . . in only 5 seconds . . . of refractory and metal surface temperatures between 100° F. and 2400° F. No emissivity corrections are required, yet this pyrometer is accurate within ±0.5%.

The Land Pyrometer not only transmits radiation under near-perfect black body conditions, but fully compensates for changes in ambient and radiation head temperatures. It also features a telescoping arm and can be used with a rugged Fielden millivoltmeter, spot galvanometer, or portable high-speed indicator or recorder.

WRAP UP TEMPERATURE WITH **Fielden**



Fielden simplified instrumentation can solve practically every temperature problem. For measurement you can choose from low-cost voltage or current recorders, null-balance recorders for up to 96 points, manual monitors, automatic scanners, and specialized radiation or suction pyrometers. Fielden controllers range from electric on-off types up to proportional pneumatic controllers. In addition, Fielden supplies a complete line of sensing elements, accessories and supplies.

Send for Literature

Mr. Controls®

Robertshaw-Fulton CONTROLS COMPANY

FIELDEN INSTRUMENT DIVISION

Dept. D, 2920 N. 4th St., Philadelphia 33, Pa.

(*Concluded from Page* 93)

components. Dies used to manufacture these components are made by A. O. Smith's tooling facilities. The division also turns out tools for Smith's line pipe, pressure vessel, and aeronautical and water heater operations.

Enters Thermostat Field

Norwalk Thermostat Co., Norwalk, Ohio, has been formed to manufacture a line of electric thermostats. Operations will start by Nov. 15. Officers are: President, Dale Callihan; vice president, Edward Arlin; secretary, Rex V. Larson; and treasurer, Dr. Donald Dewald.

Lehigh Sells Part of Line

Lehigh Inc., Easton, Pa., sold its newest automotive air conditioning compressor and related manufacturing facilities to the York Div. of Borg-Warner Corp., Chicago. Lehigh will concentrate on hermetic and open type condensing units and other refrigeration products.

Statham Changes Name

Statham Laboratories Inc., Los Angeles, changed its name to Statham Instruments Inc.

To Grow Single Crystals

Single Crystal Corp. of America has been organized at Saxonburg, Pa., to grow single crystals of various materials. Many such crystals have electronic, optical, and nuclear applications.

Boosts Ceramic Operations

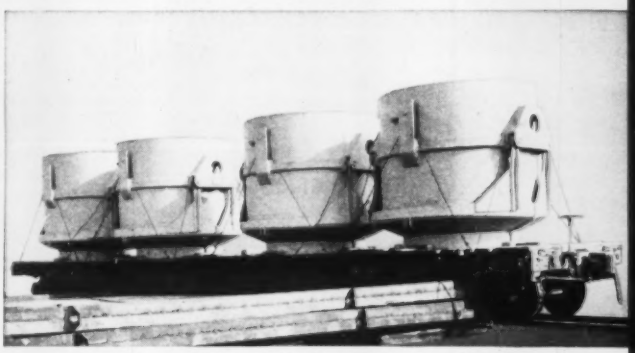
The ceramic manufacturing operations of Sylvania Electric Products Inc., New York, have been made a unit of the Parts Div., Mineola, N. Y. Present manufacturing facilities at Mineola, which produce small ceramic components for electron tubes and connectors, will be expanded for the manufacture of a wide variety of precision ceramic parts and vacuum-tight ceramic-to-metal composites. Among the ceramic components manufactured by Sylvania are tub-

STEEL PLATE *Fabricating Facts!*

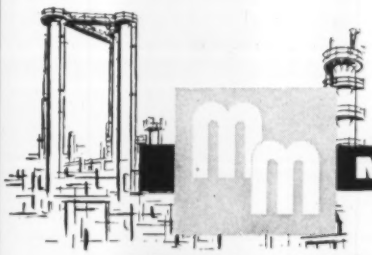
McGREGOR-MICHIGAN
Brochure Describes Diversified Facilities and Production

In this compact 12-page brochure you'll find valuable information on McGregor-Michigan's equipment and typical steel plate fabrications. It shows scenes in our new 30,000 square foot Heavy Fabricating Plant and our original Rivard plant. It describes some of our new equipment including a 650 ton press brake and our 600 ton "Bulldozer" horizontal forming press capable of forming heavy beams or solid sections. In addition you'll find clear illustrations of steel plate fabrications for the primary metal producers—ladles, buckets, hooks, doors, water-cooled roof rings and others—and equally interesting chemical and petroleum processing equipment—ASME Code vessels, autoclaves, heat exchangers, kettles and tanks. Many of these assemblies run to 50 tons and over, in mild, stainless and alloy steels. Typical miscellaneous industrial fabrications shown are engine beds, bases for machines, jigs and fixtures, heavy-wall cylinders, foundry cupola shells, furnace casings, a self-propelled sewer tunnel shield and a heavy boom for a power shovel. The brochure also describes our plate warehousing and specialized surface treating services.

We would appreciate your including this informative booklet in your file of fabricating sources. Please send for a copy and the name of our representative nearest you or call direct for prompt service on any steel plate fabricating problem.



Clam shell charging buckets destined for leading West Virginia aluminum plant.



AMERICAN STEEL WAREHOUSE ASSOCIATION — BETTER DISTRIBUTION

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DURASPUN

HIGH ALLOY CASTINGS FOR HIGH TEMPERATURE SERVICE

1700°F

Here's an Annealing Retort for 1700° F Service 35% Ni—15% Cr 30" Diameter 30' Long

Duraloy is the place to come for high alloy castings—for high temperature service, for highly corrosive service. Castings to your specifications are a Duraloy specialty.

We are equipped to do large and small work. We can turn out single static castings of 7 tons or more and single centrifugal castings up to about 4½ tons. On your next high alloy casting job, check with Duraloy!

Send for Bulletin No. 3354-G

The DURALOY Company

OFFICE AND PLANT: Scottdale, Pa.

EASTERN OFFICE: 12 East 41st Street, New York 17, N. Y.
ATLANTA OFFICE: 76—4th Street, N.W.
CHICAGO OFFICE: 332 South Michigan Avenue
DETROIT OFFICE: 23906 Woodward Avenue, Pleasant Ridge, Mich.

ing, rods, discs, spacers, rings, vacuum tube housings, and bearings.

Enters Automation Field

Aerojet-General Corp., a subsidiary of General Tire & Rubber Co., Akron, primarily engaged in research and development on guided missiles and rockets, has entered the field of automation. It has designed an automatic machine for cutting and marking the steel plates used in shipbuilding. The device "reads" 1/10 scale drawings and automatically directs torches and punches which cut and mark 12 by 50-ft steel plates.

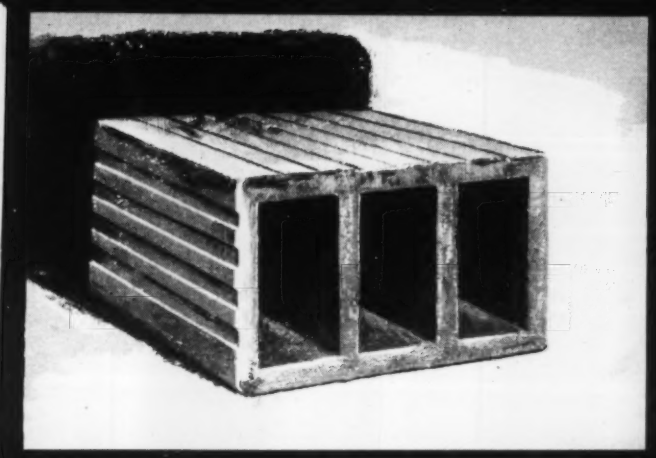
CONSOLIDATIONS

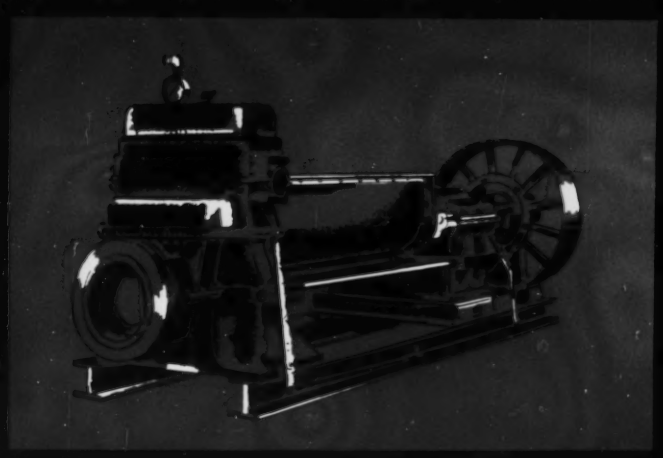
Adirondack Foundries & Steel Inc., Watervliet, N. Y., will sell its name, business, machinery, and equipment to **Consolidated Foundries & Mfg. Corp.**, Chicago. If stockholders approve, Adirondack Foundries will retain ownership of real estate and buildings and will lease them to Consolidated.

Pantex Mfg. Corp., Pawtucket, R. I., purchased Spinform Inc., Attleboro, Mass., specialist in forming and spinning all types and gages of metals and alloys.

Dresser Industries Inc., Dallas, will acquire **Gardner-Denver Co.**, Quincy, Ill., producer of compressors, pumps, rock drills, and air tools. Gardner-Denver will be combined with four other subsidiaries of Dresser to form a new wholly owned subsidiary, Gardner-Dresser Co., with headquarters at Quincy. The organizations that will be combined are Gardner-Denver; Clark Bros. Co., Olean, N. Y.; Pacific Pumps Inc., Los Angeles; and Dresser's divisions: Roots-Connersville Blower, Connersville, Ind., and Ideco, Dallas. G. V. Leece, president of Gardner-Denver will be chief executive officer of Gardner-Dresser.

Buhr Machine Tool Co., Ann Arbor, Mich., purchased **Sidney Machine Tool Co.**, Sidney, Ohio, manufacturer of heavy duty, precision metalworking lathes. Administra-





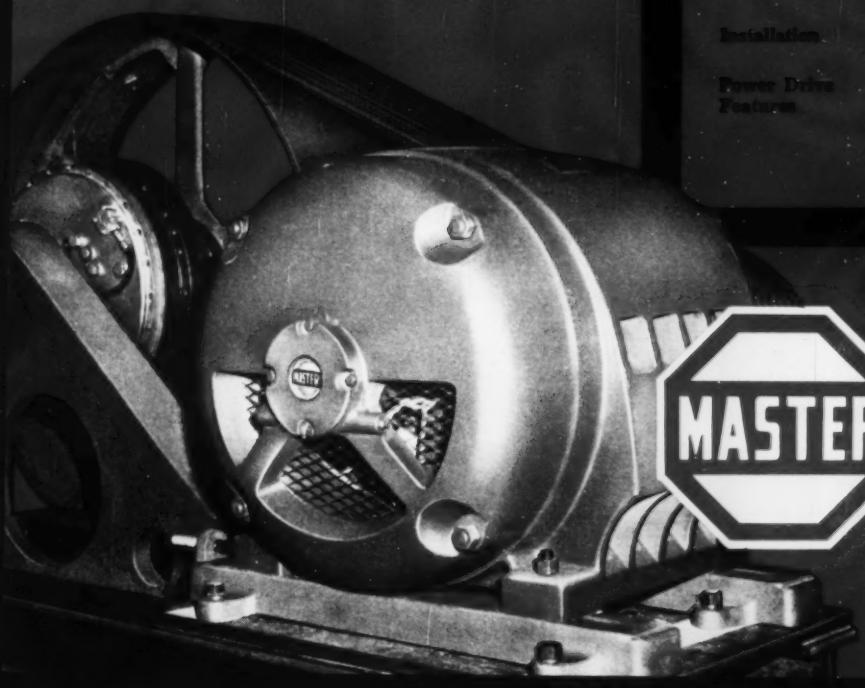
No Margin for Air– No Margin for Error

ANOTHER DRIVE REQUIREMENT MEETS ITS MASTER

Yes, it's a fact—unless you remove the air from the clay, you get a no-good tile. And whether air is your problem, or not—error is always a problem. And it's never a mistake to come to Master for the right power drive. In every kind of industry, Master customized package drives give you the utmost in flexibility, compactness and performance.

Here, the primary requirement is power—and the husky, big 200 H.P. Master fills the bill year in and year out. Your requirements might be better met by integrating Master components into a single, efficient, compact unit for the right horsepower, right shaft speed and right mounting features. What are they?

A husky 200 H.P., 440 volt squirrel cage induction Master Motor powers this 14-ton De-Airing Brick and Tile Machine with a capacity of over 8000 bricks per hour. Two parallel shafts carrying pug knives work clay, pass it into vacuum chamber with auger cylinders where it is finished and discharged.



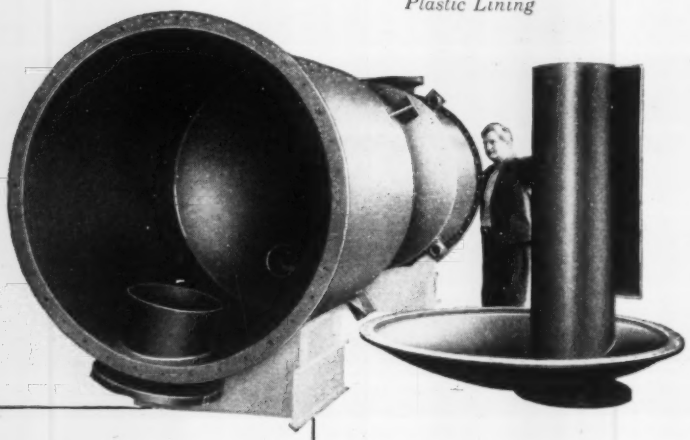
Motor Ratings	½ to 400 H.P. All phases, voltages and frequencies.
Motor Types	Squirrel cage, slip ring, synchronous, repulsion-start induction, capacitor, direct current.
Construction	Open, enclosed, splashproof, fan-cooled, explosion-proof, special purpose.
Speeds	Single-speed, multi-speed, and variable speed.
Installation	Horizontal and vertical, with or without flanges and other features.
Power Drive Features	Electric brakes (2 types)—5 types of gear reduction up to 432 to 1 ratio. Mechanical and electronic variable speed units—fluid drives—every type of mounting.

MASTER

THE MASTER ELECTRIC COMPANY

DAYTON 1, OHIO

Pulp Tank prepared for Plastic Lining



KIRK & BLUM

offers specialized experience in

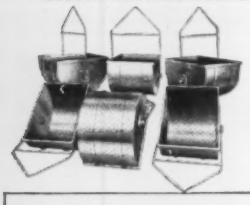
STAINLESS STEEL FABRICATION

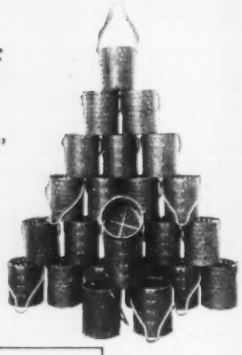
Stainless fabrication is distinctively different from conventional steel working. The Kirk & Blum organization has the special knowledge and technique required . . . and the experience and necessary equipment for this highly specialized type of work. With 50 years of experience in sheet metal fabricating, Kirk and Blum offers quality workmanship, economical fabrication to the most exacting specifications . . . in large or small quantities.

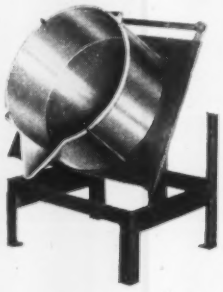
Complete facilities to ¼" capacity for: square or rotary shearing; braking, forming, rolling; punching, riveting, drilling; arc, spot and seam welding; inert gas and submerged arc welding; grinding and finishing. For prompt quotation, send prints and details.

THE KIRK & BLUM MANUFACTURING CO.
3226 FORRER STREET
CINCINNATI 9, OHIO

Literature on request:
"SHEET and PLATE FABRICATION"
"ELECTRICAL ENCLOSURES"







KIRK & BLUM **METAL FABRICATION**

We Bring Your Prints to Life

tive officers of Sidney Machine will be J. H. Buhr, president, and W. R. Gerchow, executive vice president and general manager.

Budd Co., Philadelphia, purchased the **Krouse Testing Machine Co.**, Columbus, Ohio, manufacturer of fatigue testing machines.

Sun Chemical Corp., Long Island City, N. Y., purchased **Ansbacher-Siegle Corp.**, Staten Island, N. Y., pigment manufacturer. The acquisition is subject to approval by Sun's stockholders.

ASSOCIATIONS

Pressed Metal Institute, Cleveland, elected these officers: President, C. E. Stryker, Maysteel Products Inc., Milwaukee; first vice president, Carter Higgins, Worcester Pressed Steel Co., Worcester, Mass.; second vice president, D. W. Clay, Parish Pressed Steel Div., Dana Corp., Reading, Pa.; secretary-treasurer, Byrant Gemmill, American Stamping Co., Cleveland; and assistant secretary-treasurer, Mel Lorentz, HPL Mfg. Co., Cleveland.

Powder Metallurgy Parts Manufacturers Association, Pittsburgh, elected these officers: President, K. M. Gleszer, Dixon Sintaloy Inc., Stamford, Conn.; first vice president, W. R. Toeplitz, Bound Brook Oil-Less Bearing Co., Bound Brook, N. J.; secretary-treasurer, G. L. Bachner, Yale & Towne Mfg. Co.'s Powdered Metal Products Div., Franklin Park, Ill.

NEW ADDRESSES

Lehigh Mfg. Co., Lancaster, Pa., is moving its condensing unit and compressor manufacturing facilities from that city to the company's Easton, Pa., plant. The move will be completed by Dec. 15.

Stauffer Chemical Co., New York, moved the general offices of its Consolidated Chemical Industries Div. to larger quarters at 6910 Fannin St., Houston, Tex.

(*Please turn to Page* 104)

Ferro alloys, of course! And Vancoram ferro alloys are the finest you can use for stainless and heat-resisting steels and irons.

Regardless of your melt-shop requirements, there are Vancoram products that will meet them exactly. Look no further than the Vancoram line. It's complete — and it offers you unexcelled quality, backed by unexcelled service!

CHOOSE THE RIGHT ALLOYS FROM VCA'S COMPLETE LINE

EXLO® (max. .025% and max. .05% Carbon grades)
Standard High Carbon Ferrochromium
Ferrochromium "55"
Ferrochromium "63"
Low and Medium Carbon Ferrochrome—silicon alloys (4 grades)
Regular Low Carbon Ferrochromium (6 grades)
Low Carbon Ferrotitanium (5 grades)
Ferrocolumbium
Grainal Alloys
Silicon Alloys (all grades)

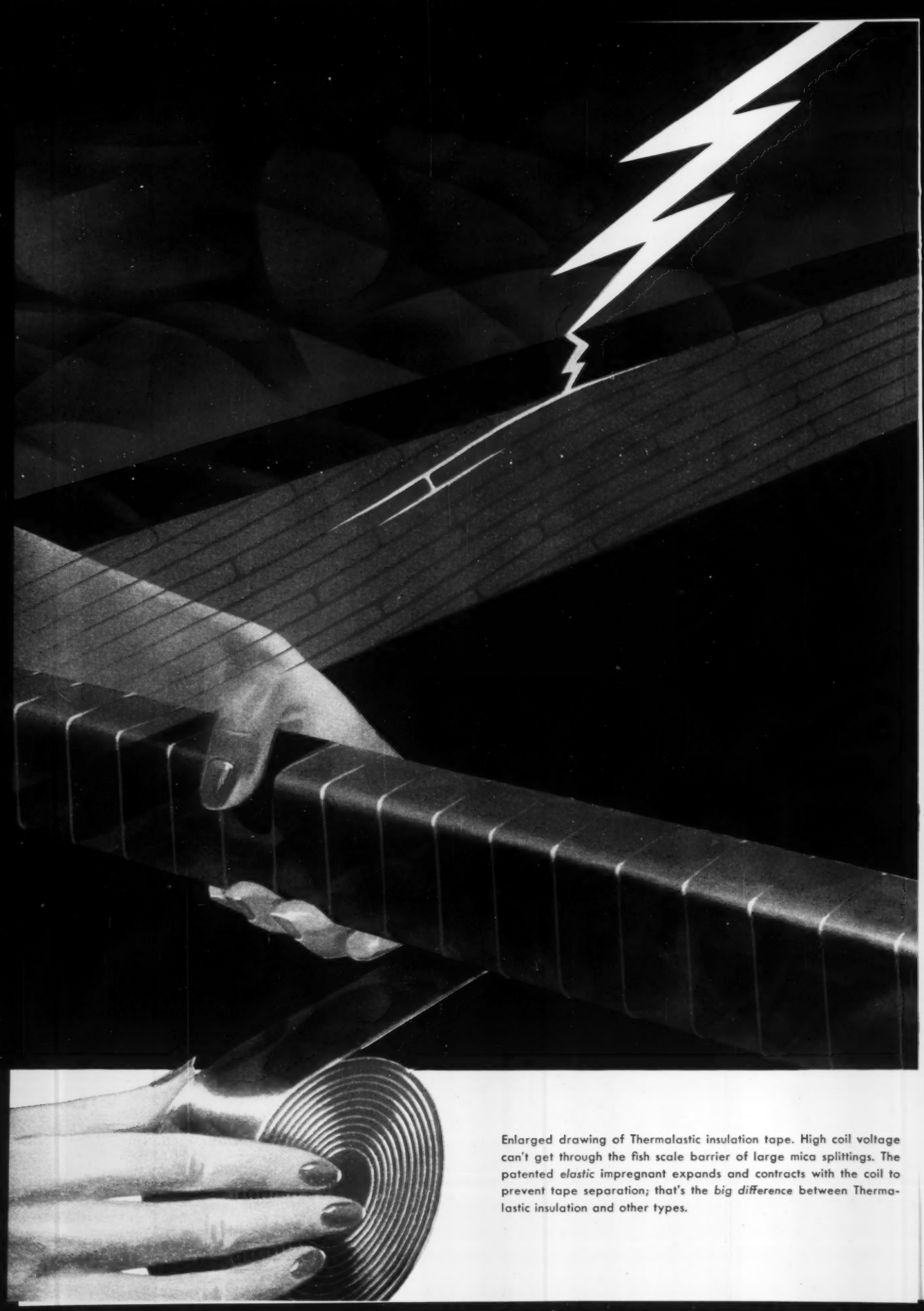
Write today for the Vancoram Products List which shows composition and applications of all Vancoram Products.

VANCORAM

VANADIUM CORPORATION OF AMERICA

420 Lexington Avenue, New York 17, N. Y.
Chicago • Cleveland • Detroit • Pittsburgh

Producers of alloys, metals and chemicals



Enlarged drawing of Thermalastic insulation tape. High coil voltage can't get through the fish scale barrier of large mica splittings. The patented *elastic* impregnant expands and contracts with the coil to prevent tape separation; that's the *big difference* between Thermalastic insulation and other types.

Here's why Thermalastic insulation ends major cause of generator and motor failure

LARGE mica splittings have long been recognized as the most reliable coil insulation material, but for years it seemed impossible to find the RIGHT impregnant for the insulation tape.

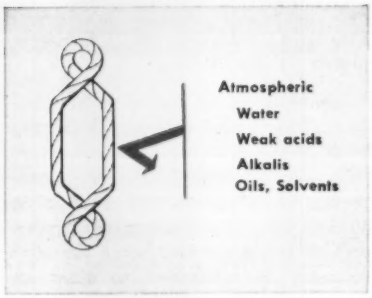
Some were too brittle and others too plastic at high coil temperatures; none could withstand repeated expansion and contraction of the coil . . . and sooner or later, tape separation caused failures.

Then the great discovery — In 1949, Westinghouse research scientists made *Thermalastic*® insulation a reality by discovering the "miracle resins" which cure to a *tough* resilient solid. Large mica splittings, overlapped like fish scales, are locked in this elastic bond which "breathes" . . . expands and contracts with the coil. It doesn't harden or soften with repeated heating by the coil. It doesn't deteriorate with age.

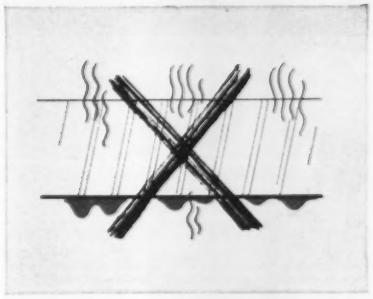
New color movie and bulletin show how and why Thermalastic insulation has extended the life of more than 40 million kva of generators and large motors. Contact your Westinghouse representative or write to Westinghouse Electric Corporation, P.O. Box 868, Pittsburgh 30, Pennsylvania. J-15004

YOU CAN BE SURE... IF IT'S

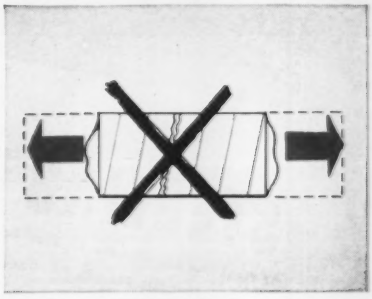
Westinghouse



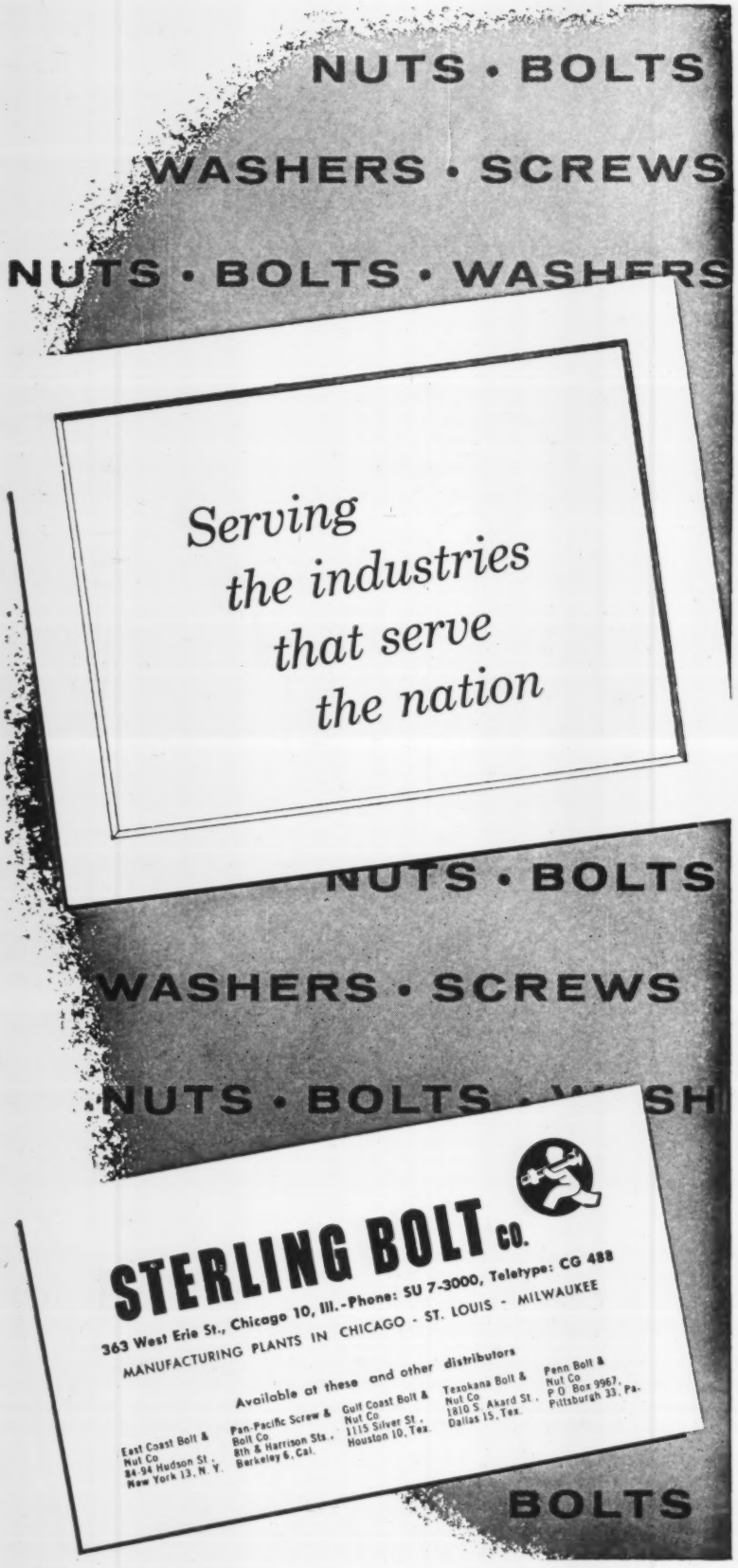
Withstands attacks
which weaken and finally destroy other insulations. The Thermalastic insulation bond is void-free, has great density, and it's chemically inert. The physical strength of the resilient insulation wall is far greater than that of ordinary insulations.



Doesn't soften or embrittle
The patented resins in Thermalastic insulation are thermosetting . . . heat changes them from a liquid to a permanently elastic solid which doesn't soften or embrittle after repeated heating. And it doesn't deteriorate while in storage or in use.



Not stressed
The insulated coil is heated to operating temperature, and *while it's expanded,* the resins cure to an ELASTIC solid. That's why Thermalastic insulation is relaxed when the coil expands, compressed when it contracts. It flexes when the coil is overloaded.


NUTS • BOLTS
WASHERS • SCREWS
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MANUFACTURING PLANTS IN CHICAGO - ST. LOUIS - MILWAUKEE
Available at these and other distributors
East Coast Bolt & Nut Co 84-94 Hudson St., New York 13, N. Y.
Pan-Pacific Screw & Bolt Co 8th & Harrison Sts., Berkeley 6, Cal.
Gulf Coast Bolt & Nut Co 1115 Silver St., Houston 10, Tex.
Texokana Bolt & Nut Co 1810 S. Akard St., Dallas 15, Tex.
Penn Bolt & Nut Co P.O. Box 9967, Pittsburgh 33, Pa.
BOLTS

(*Concluded from Page* 100)

Pacific Metals Co. Ltd. opened its new warehouse at 1900 Third St., San Francisco, Calif. The company bought the 193,000 sq-ft warehouse for $1,250,000 and remodeled it.

NEW OFFICES

Fairmont Aluminum Co., Fairmont, W. Va., producer of aluminum sheets, coils, and circles, opened a district office at 4200 Montgomery Rd., Cincinnati, Ohio. A. Joe Snider is district manager. The firm is a wholly owned subsidiary of Cerro de Pasco Corp., New York.

Summer & Co. is opening a scrap brokerage office at 2015 Highland Ave., Birmingham, Ala. R. A. Baker is manager.

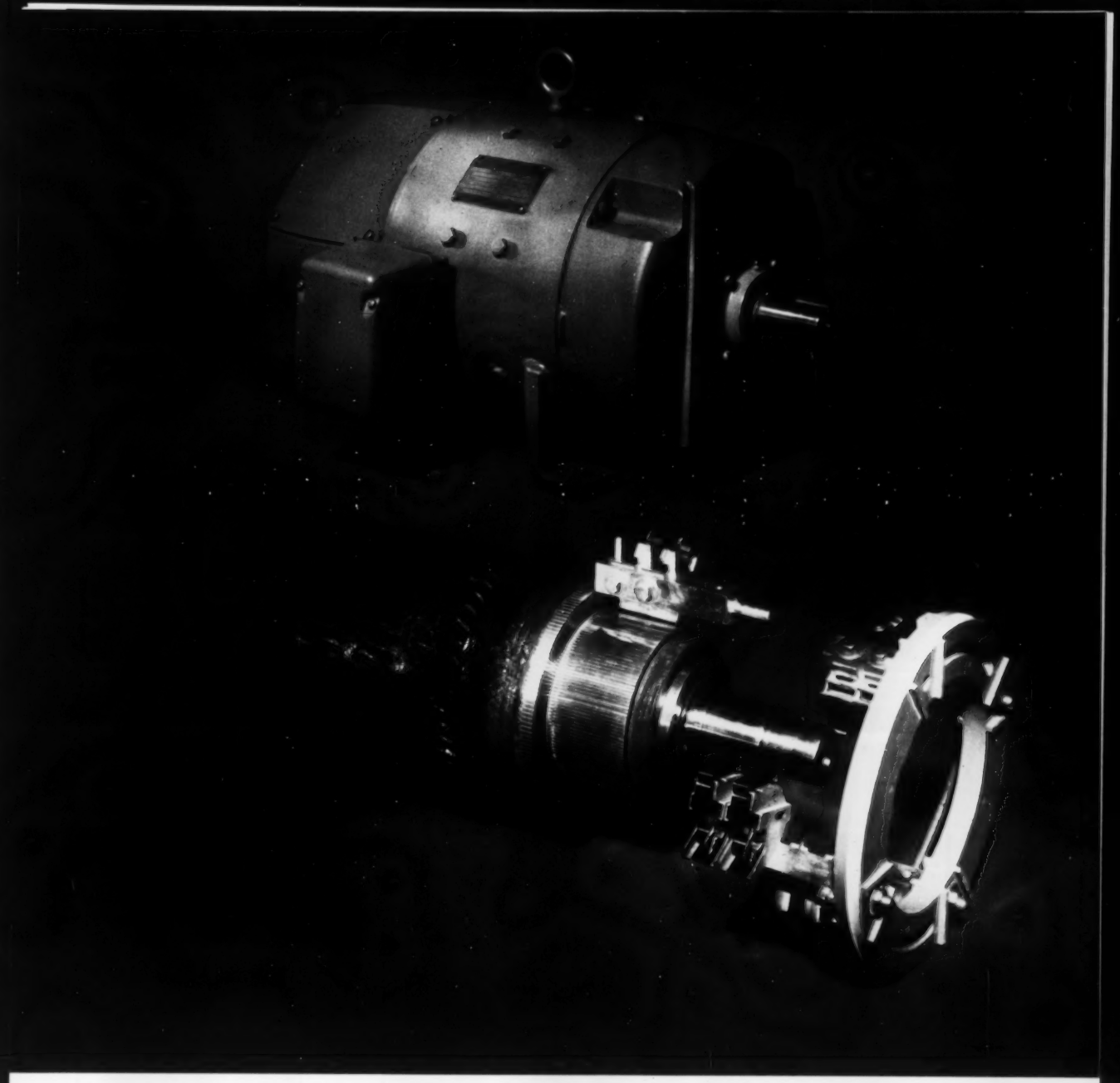
Industrial Superintendence Co. Inc. opened an office at 451 N. La Cienega Blvd., Los Angeles, Calif., to offer international sales and supervision service to importers and exporters.

NEW PLANTS

E. J. Lavino & Co., Philadelphia, will build a plant at Freeport, Tex., for the production of magnesite (periclase) from sea water. Output will be shipped to Lavino's refractory plant at Plymouth Meeting, Pa. The project (it'll cost about $8 million) should be completed by mid-1959.

Controls Co. of America, Schiller Park, Ill., plans to build a 50,000 sq-ft plant at North Manchester, Ind., to house operations transferred from its facility at Spring Valley, Ill. Production of timers and switches for the home laundry industry is scheduled to start in January. The company also produces valves, thermostats, and other controls for home heating, commercial refrigeration, and automobile air conditioning equipment.

Gay Steel Fabricators, Dallas, is building a plant at Kaufman, Tex.



NEW GENERAL ELECTRIC DC MOTOR GIVES

Extra Power To Meet Peak Loads

KINAMATIC* . . . *a new standard in industrial direct-current motors* . . . designed to meet the vital power load requirements of modern manufacturing methods.

Proper Design Balance . . . means unmatched commutating ability . . . the ability to deliver the short bursts of power required for quick acceleration and deceleration. Fewer turns per armature coil . . . full complement of commutating poles . . . maximum number of commutator segments, combine to permit higher peak loads.

New Brush Assembly . . . constant-pressure brush springs eliminate brush adjustments. Bronze, corrosion-resistant brush holders are mounted on square steel studs for stable operation in both directions of rotation. Molded polyester-glass yoke resists impact, intense heat and corrosion.

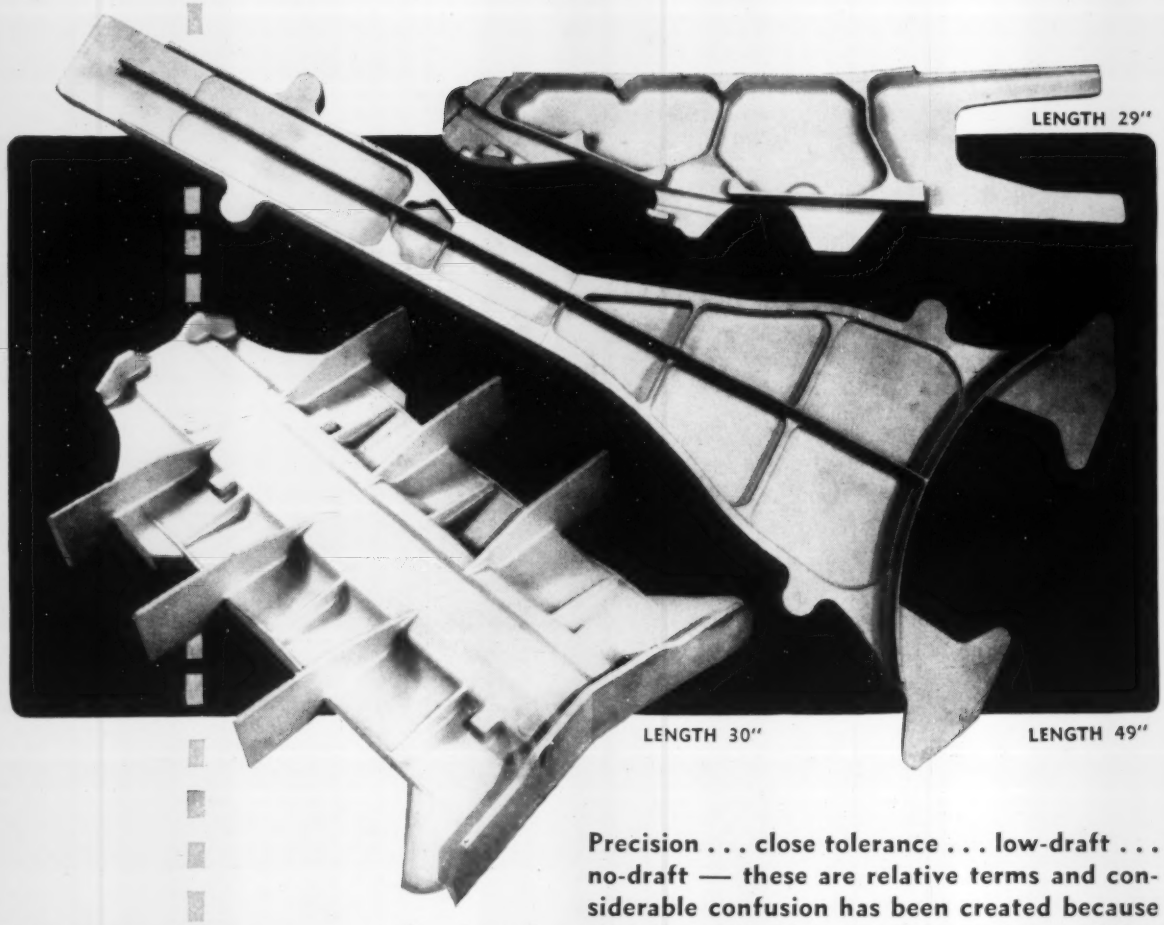
D-c Kinamatic Motors offer a reliable key to successful automation. Additional information is available at your nearest General Electric Apparatus Sales Office. Or, if you prefer, write for Bulletin GEA-6355, *Direct Current Motor and Generator Department, Erie, Pennsylvania.*

*Trade-Mark of General Electric Company. 813-11

Progress Is Our Most Important Product

GENERAL ELECTRIC

PRECISION FORGINGS By WYMAN-GORDON



Precision . . . close tolerance . . . low-draft . . . no-draft — these are relative terms and considerable confusion has been created because they have been loosely used. Close tolerances on large forgings have been pioneered by Wyman-Gordon over the years. The degree of precision which is practical now becomes a question of economics.

The forgings illustrated are typical of Wyman-Gordon close tolerance forgings that have been produced in quantity. In solving problems of tolerances, design and metallurgical quality, there is no substitute for Wyman-Gordon experience.

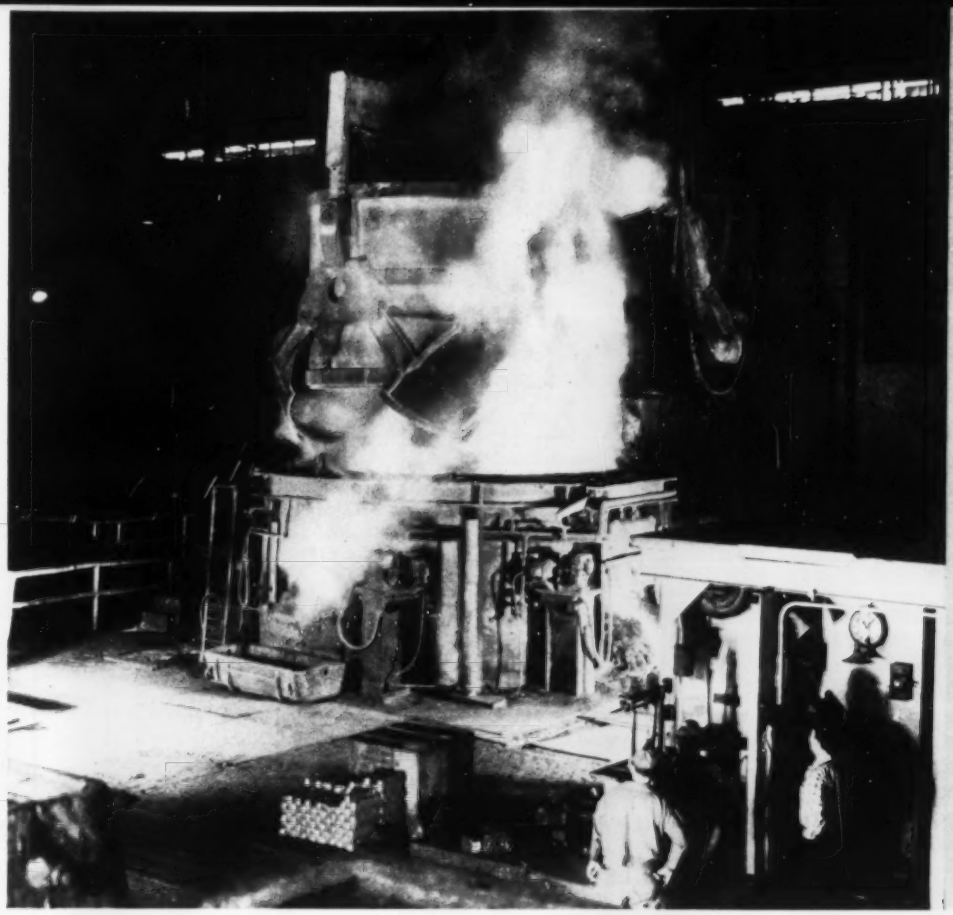
WYMAN-GORDON COMPANY

Established 1883

FORGINGS OF ALUMINUM • MAGNESIUM • STEEL • TITANIUM

WORCESTER 1, MASSACHUSETTS

HARVEY, ILLINOIS • DETROIT, MICHIGAN



A SPECIAL STEEL STUDY

For Men Who Are Seeking To Increase Profits

TRENDS IN METALS

Stainless Steels

THE aristocrat of metals, stainless steel, is as remarkable as the age in which we live. Its future is as secure as its present because it is as much at home in an atomic reactor or the launching platform for a missile as it is on your car or in your kitchen.

Strength, eye appeal, resistance to corrosion, resistance to high temperatures, and ease of cleaning give it its rare universality.

Users predict that more and more jobs will go to stainless (see Page 108). Trends in application (see Page 113), design, and fabrication (see Page 119) bear them out.

Not bad for a metal that was just being developed when Orville Wright made his historic flight at Kitty Hawk in 1903! Twenty years ago, stainless production was only a "drop in the bucket." In the last ten years, its production has doubled. Volumewise, a little more than 1 per cent of all steel produced is stainless. Dollarwise, its share of the market is much more impressive because it is our most expensive steel.

Its biggest user, motordom, took around one-sixth of all shipments last year. The 1958 Plymouth, for example, will sport an average of 22 lb per car. The 1958 Cadillac will have 22.3 lb in its chassis, 13.7 lb in its body.

Within the last five years, the aircraft and missile industry has become the second largest user. It took about 8 per cent of the metal ($75 million worth) in 1956. One producer is convinced the industry will become the top user (about $200 million annually) in the next five years.

Boeing Airplane Co., Seattle, used about 1.9 million lb in 1956. Douglas Aircraft Co. Inc., Santa Monica, Calif., uses 2,740,000 lb a year in its own plants and 967,000 lb in its subcontractors' shops.

REPORT CONTINUED

1 PRODUCTION

Some 60 U. S. firms make mill stainless, helping to double production in a decade. About 50 grades are produced, but just 11 of them represent 85 per cent of the market

THREE SCORE companies in the U. S. make wrought (mill) forms of stainless. They and their products are listed below.

By far the largest tonnages come from the electric-arc furnace through the refining of scrap. Some specials are melted down from master alloys or selected scrap in crucible induction furnaces. A few alloys with extreme properties are made in consumable electrode or other vacuum furnaces.

Premium Product—The cost of ingredients going into stainless and the extreme care used in making it help to account for its price. Another factor: Yield from a stainless ingot is low. Mills have to do a lot of conditioning of the semifinished steel and shearing of the finished product.

Distribution—Stainless is sold in smaller quantities than carbon steel, so a bigger percentage of the metal reaches the user via warehouses. (One-third is sold this way, versus only one-fifth for carbon steel.)

Cold-rolled strip accounts for one-third of all shipments, cold-rolled sheets one-fourth.

Ingredients—Chromium is the chief element that makes steel stainless. Nickel is added to beef up heat resistance and ductility and bring out other properties. Minute amounts of other elements help tailor the metal for specific jobs.

Chromium-nickel steels (austenitic) are known as the 300 series, chromium steels (martensitic and ferritic) as the 400 series, and low chromium heat resisting steels as the 500 series (see Page 121). A 200 series has been added to cover chromium-nickel-man-

STAINLESS STEEL PRODUCERS and What They Make

Company & Principal Office	Semifinished	Plates	Sheets, Hot Rolled	Sheets, Cold Rolled	Strip, Hot Rolled	Strip, Cold Rolled	Bars, Hot Rolled	Bars, Cold Finished	Tube Rounds	Electricweld Pipe & Tubing	Seamless Pipe & Tubing	Mech. & Pressure Pipe & Tubing	Wire Rods	Drawn Wire	Extrusions	Stainless Clad Plates	Stainless Clad Sheets or Strip	Other, Including Structural Shapes
ALLEGHENY LUDLUM STEEL CORP. Pittsburgh	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
AMERICAN STEEL & WIRE DIV., U. S. Steel Corp., Cleveland						X		X						X				
ANCHOR DRAWN STEEL CO., division of Vanadium-Alloys Steel Co., Latrobe, Pa.								X					X	X				
ARMCO STEEL CORP. Middletown, Ohio	X	X	X	X	X	X	X	X	X				X	X				X
BABCOCK & WILCOX CO., Tubular Products Div., Beaver Falls, Pa.	X								X	X	X	X			X			
BETHLEHEM STEEL CO. Bethlehem, Pa.	X						X											
BISHOP & CO., J. Malvern, Pa.										X	X	X		X				X
BYERS CO., A. M. Pittsburgh	X	X		X	X	X	X	X	X									
CARLSON INC., G. O. Thorndale, Pa.		X																X
CARPENTER STEEL CO. Reading, Pa.					X	X	X	X	X	X		X	X	X				X
CHARTER WIRE PRODUCTS Sterling, Ill.								X						X				
CRUCIBLE STEEL CO. OF AMERICA Pittsburgh	X	X	X	X		X	X	X	X	X		X	X	X				X
DAMASCUS TUBE CO. Greenville, Pa.									X	X		X						
DRIVER CO., WILBUR B. Newark, N. J.	X				X	X							X	X				
DRIVER-HARRIS CO. Harrison, N. J.						X								X				
EASTERN STAINLESS STEEL CORP. Baltimore	X	X	X	X														
FIRTH STERLING INC. Pittsburgh	X						X	X										
FORT WAYNE METALS INC. Ft. Wayne, Ind.														X				
GREEN RIVER STEEL CORP., subsidiary of Jessop Steel Co., Owensboro, Ky.	X		X						X									

STAINLESS STEEL PRODUCERS and What They Make

Company & Principal Office	Semifinished	Plates	Sheets, Hot Rolled	Sheets, Cold Rolled	Strip, Hot Rolled	Strip, Cold Rolled	Bars, Hot Rolled	Bars, Cold Finished	Tube Rounds	Electricweld Pipe & Tubing	Seamless Pipe & Tubing	Mech. & Pressure Pipe & Tubing	Wire Rods	Drawn Wire	Extrusions	Stainless Clad Plates	Stainless Clad Sheets or Strip	Other, Including Structural Shapes
INDIANA STEEL & WIRE CO. Muncie, Ind.														X				
INGERSOLL STEEL DIV., Borg-Warner Corp. New Castle, Ind.	X	X	X													X	X	
IVINS STEEL TUBE WORKS INC., ELLWOOD Oak Lane Station, Philadelphia										X	X	X						
JESSOP STEEL CO. Washington, Pa.	X	X	X				X	X								X		X
JOHNSON STEEL & WIRE CO. INC. Worcester, Mass.														X				
JONES & LAUGHLIN STEEL CORP. Pittsburgh	X		X*	X*	X*	X	X	X	X				X	X	X			
JOSLYN STAINLESS STEELS Chicago	X						X	X	X				X	X				
LATROBE STEEL CO. Latrobe, Pa.							X	X	X									X
LUKENS STEEL CO. Coatesville, Pa.																X		
MARYLAND FINE & SPECIALTY WIRE CO. INC. Cockeysville, Md.														X				
McINNES STEEL CO. Corry, Pa.																		X
McLOUTH STEEL CORP. Detroit	X	X	X	X	X	X	X											
METAL FORMING CORP. Elkhart, Ind.												X						X
MIDVALE-HEPPENSTALL CO. Philadelphia	X								X		X	X			X			X
NATIONAL-STANDARD CO. Niles, Mich.														X				
NATIONAL TUBE DIV., U. S. Steel Corp. Pittsburgh											X	X						
PACIFIC TUBE CO. Los Angeles									X		X	X						
PAGE STEEL & WIRE DIV., American Chain & Cable Co. Inc., Monessen, Pa.														X				X
PITTSBURGH ROLLING MILLS INC. Pittsburgh						X								X				X
REPUBLIC STEEL CORP. Cleveland	X	X	X	X	X	X	X	X	X	X		X	X	X			X	X
RIVERSIDE-ALLOY METAL DIV., H. K. Porter Company Inc., Riverside, N. J.						X							X	X				
RODNEY METALS INC. New Bedford, Mass.						X												
SAWHILL TUBULAR PRODUCTS INC. Sharon, Pa.										X	X	X						
SHARON STEEL CORP. Sharon, Pa.	X	X			X	X												
SHARON STEEL CORP., Dearborn Div. Detroit						X												
SIMONDS SAW & STEEL CO. Lockport, N. Y.	X	X	X				X											
SPECIALTY WIRE CO. INC. Worcester, Mass.														X				
STANDARD TUBE CO. Detroit										X		X						
SUPERIOR STEEL CORP. Carnegie, Pa.				X	X	X											X	
SUPERIOR TUBE CO. Norristown, Pa.											X	X						
SWEPCO TUBE CORP. Clifton, N. J.										X		X						
TECHALLOY CO. INC. Rahns, Pa.						X		X					X	X				
TIMKEN ROLLER BEARING CO. Canton, Ohio	X						X	X	X		X	X						
TRENT TUBE CO., subsidiary of Crucible Steel Co. of America, East Troy, Wis.										X		X						
TUBE METHODS INC. Bridgeport, Pa.										X	X	X						
ULBRICH STAINLESS STEELS INC. Wallingford, Conn.					X	X												
U. S. STEEL CORP. Pittsburgh		X	X	X	X	X	X	X	X		X	X	X	X	X			X
UNIVERSAL-CYCLOPS STEEL CORP. Bridgeville, Pa.		X	X	X	X	X	X	X					X	X				
VANADIUM-ALLOYS STEEL CO. Latrobe, Pa.	X	X	X				X	X					X	X				
WALL TUBE & METAL PRODUCTS CO. Newport, Tenn.										X	X	X						
WALLINGFORD STEEL CO., subsidiary of Allegheny Ludlum Steel Corp., Wallingford, Conn.				X		X						X						X
WASHINGTON STEEL CORP. Washington, Pa.				X		X												

*Production expected to start in 1958.

ganese grades which emerged during the nickel shortage after the Korean War.

Producers Are Busy—Stainless has amazing versatility, and producers are working to make it better. Here are the areas to watch:

1. Colored stainless: Mills can't make it with colors that compete with anodized aluminum. There's no conversion coating that will take dye. Blackening, porcelain enamel, organic coatings, and textured surface treatment are answers to colored anodizing.

2. Wider, thinner, and flatter stainless: Users want coiled sheets 48 in. wide, hand mill sheets 72 in. wide, and Sendzimir strip 48 in. wide rolled to table-top flatness. More Sendzimir and other wide cold mills—with hot mills back of them—are being installed to meet width and tolerance demands, but table-top flatness is hard to get.

3. Stainless for extreme temperature use: Precipitation hardening types for service to 1000° F and new martensitic grades that retain their hardness to 1100° F are steps in the right direction. But mills don't like them; heat treatments are too tricky and too many heats have to be scrapped.

4. New mill finishes: The dairy industry wants mirror finishes. Architects want dull, nonreflective finishes. The auto industry wants textured and brushed finishes. Mills are meeting these demands.

5. New clads: The stainless-carbon sandwich has done well; a stainless-copper sandwich is growing in popularity; and a stainless-aluminum sandwich is in the offing. The big market potential is in cookware and heat exchanger tubing.

6. Cheaper stainless: Users want stainless that commands a good scrap price. That means lots of nickel, little manganese, few tramp elements. Mills plan to embark on a strong program of consumer education, calculated to create a demand for more stainless in places where lower-priced grades like 410 and 202 can be used. Bigger volume would mean lower mill costs and lower prices.

2 SURVEY

Almost half the respondents in STEEL's survey use the bright metal. Nonusers complain about cost, but some of them will switch to stainless next year

TO FIND OUT what stainless users are doing today and planning for tomorrow, STEEL surveyed 2496 metalworking plants employing 20 or more persons.

Returns show that 45.8 per cent use the bright metal, 54.2 per cent do not.

Distribution—More than 85 per cent of the users fall into these major industrial classifications: Transportation and fabricated metal products (except ordnance and machinery), 39 per cent; machinery (except electrical), 37.5 per cent; electrical machinery, equipment, and supplies, 10 per cent.

The complete rundown includes: Instruments—professional, scientific, and controlling (5.5 per cent); miscellaneous manufacturing industries (4 per cent); primary metal industries (2.5 per cent); furniture and fixtures (1.5 per cent).

Next Decade—A substantial majority (68 per cent) expects to use larger quantities of stainless over the next ten years (see opposite page).

Grades—Of the 26 types of stainless used by respondents, these were mentioned most frequently: 302 (used by 35.5 per cent); 304 (33.5 per cent); 303 (24 per cent); 430 (22 per cent); 316 (14.2 per cent); and 416 (14 per cent).

Quantities—More than one-third handle 1 to 5 tons annually. Here is a percentage breakdown, showing the distribution of users by tonnage categories and their estimates for 1958:

	1956*	1957	1958
	%	%	%
1 ton	14.5	11.0	8.5
1-5	32.5	35.0	33.5
6-10	14.5	10.5	11.0
11-19	6.5	11.5	8.5
20-49	10.0	10.0	12.5
50-99	8.0	12.5	12.0
100-249	6.0	5.5	8.0
250-499	2.5	1.5	3.5
500-999	1.0	1.0	2.0

*3 per cent of current users did not use stainless in 1956.

Less than 2 per cent of the firms have requirements exceeding 1000 tons a year.

Imports Hurt—Explaining why his firm will use

68% Plan To Use More

While respondents to STEEL's survey predict increases of 5 to 500 per cent in the next ten years, about one-third forecast gains up to 25 per cent. Most respondents favor either 10 or 20 per cent. Some 29 per cent expect to maintain their present level of consumption. Only 3 per cent say they'll use less.

68%
EXPECT TO INCREASE USE OF STAINLESS

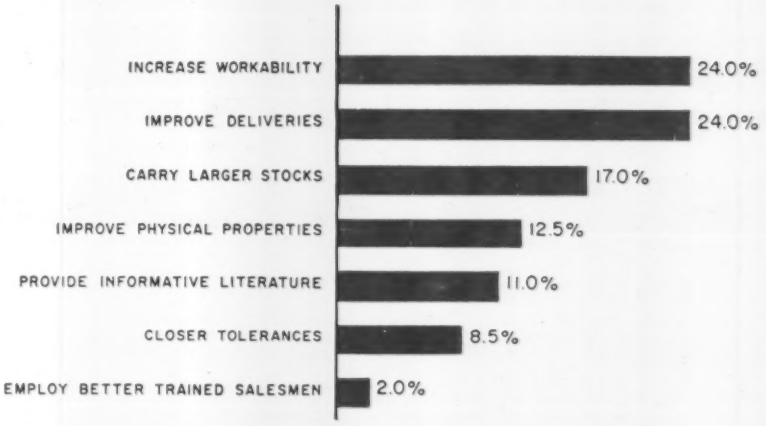
63%
MENTION COST AS BIGGEST PROBLEM

63% Say Cost Is Barrier

One-fifth of the survey respondents say formability characteristics of stainless are a problem, as far as using it in their product is concerned. Some 8 per cent want improved tolerances; 8 per cent want better surface finish. Only one firm in 100 complains about inadequate gage.

24% Want Better Workability and Deliveries

Note that four of the seven suggestions by survey respondents for boosting stainless consumption have nothing to do with technical improvements. The four involve the marketing of the metal.



less stainless this year than last, a Connecticut flatware manufacturer cites the problem of Japanese competition. From a Massachusetts firm in the same business there's a similar report: "We can't use more stainless because of 19-cent-an-hour Japanese labor."

Users Speak—Asked to list the metal's principal shortcomings, 63 per cent of the firms mentioned cost (see Page 111).

Other complaints: "Cutting tools won't hold an edge; pits develop in stainless blades; no two companies making the same grade have the same machinability; stainless cannot hold heat (300 to 330° F) in application as a pressing surface with a radius." Says a Cleveland chemical manufacturer: "Because of the extensive corrosion in our plant, we look forward to the day when stainless will be completely stainless."

In defense, Joseph A. Lombard, design engineer for Harrigan & Reid Co., Detroit, stated: "My life is dedicated to the use of stainless steel. It has its limitations, just like diamonds and gold, but those who are quick in listing shortcomings probably know little or a lot about it."

Producers Can Help—Stainless users believe producers and distributors can make the metal more useful, primarily by better workability and improved deliveries (see preceding page).

One firm suggests that producers "provide better finishes." Another asks that they "provide shipments from one heat rather than from six or seven."

Reasons for Nonuse—For a third of the companies not using stainless, cost seems to be the principal objection. "From a competitive standpoint," says a pulley manufacturer, "we would be out of business overnight." A toymaker (electric trains) says he has no need for stainless competitively. A manufacturer of steel housewares argues "competition won't permit it."

Other reasons given for nonuse: "It's not specified by customers" (30 per cent gave that explanation); "it has no application to products we make" (24 per cent); "it's not practical" (4 per cent); "there's no demand for it" (1 per cent).

Taking issue with those who complain about the bright metal's cost, Mr. Lombard declares: "It is not expensive. It is either unnecessary or necessary. If necessary, it is not expensive."

Competitive Materials—Most frequently mentioned as competitors were aluminum, carbon steels, cold-rolled strip, plated steels, galvanized sheets, copper, brass, Monel, and hot-rolled plates.

Next year, 1 per cent of the nonusers surveyed will take the plunge. Half will continue as nonusers, and 49 per cent (mostly job shops) make no predictions.

Respondents Are Using Stainless Steel in These Products

aircraft parts
animal cages
annealing boxes
atomic reactor mechanisms
automotive stampings

baby bottle warmers & sterilizers
bakery equipment
baskets
beverage coolers
blower wheels
bolts
breathing regulators
broilers
bulk milk coolers
buttons & snaps for work clothing

castings
cement machines
centrifugal coal dryers
chemical equipment
chemical spreaders
collating machines
commercial kitchen & food service equipment
conveyors
cooking utensils
cutlery
cylinders

dairy equipment
door plates
drop forgings
dry cleaning machinery
dumb-waiters

egg washers
electric motors
electrical switches
electromagnetic controls
electronic equipment
elevator buckets
envelope machinery

fasteners
filter elements & containers
fittings
flanges
flatware
freezers

gas apparatus
gears
governors
grilles
guy winches

heat exchangers
heat plugs
heating & venting equipment
high velocity burners
hoisting elevators
hot air furnaces
housings

ice cream freezers
industrial processing equipment
instruments

jail equipment
jet engines
jigs & fixtures

knife blades

latch covers (lock sets)
laundry equipment
lawn spreaders
lighting fixtures

meat cutting machinery
metering & measuring equipment
micrometers
moldings
motion picture projectors

oil seal cups

packaged steam generators
packaging machinery
paint spraying equipment
photographic equipment
pins & shafts
pipe
pressure switches
printing equipment
production machinery
pumps
push & pull bars

railings
refrigerators
roof drainage equipment

scales
screens
screw machine products
signs & displays
special machinery
springs
sprinklers & irrigation equipment

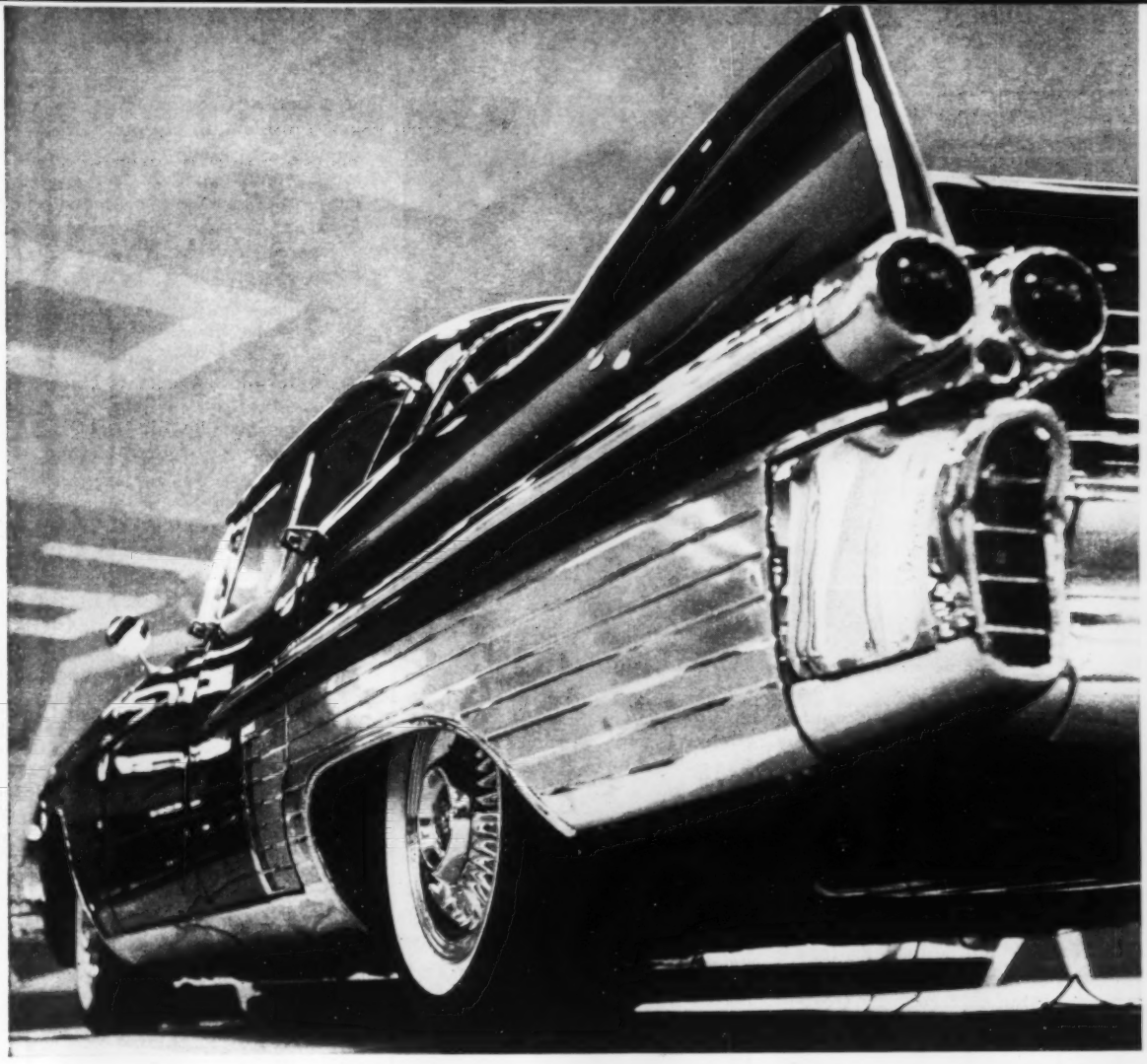
table tops
tanks
tapes
temperature controls
textile rolls & dyeing machinery
toilet partitions
transformers
truck bodies
tubing
turbocompressors

ultrasonic test equipment
underwater breathing equipment

vacuum producers
vacuum type litter collectors
valves
vending machines
vaporizers

washers
watch cases
welding rods
wheel chairs
wire forms

x-ray accessories



TRENDS IN AUTO TRIM—Some aluminum trim items are switching to stainless. Nearly half the 1958 cars will have stainless wheel covers. Some stainless trim, such as the rear quarter panel on the Cadillac, will switch to aluminum in 1958

3 APPLICATION

The amazing versatility of stainless makes it valuable for many uses. Over-all picture is one of growing application. Here are reports by industry

AUTOMOTIVE

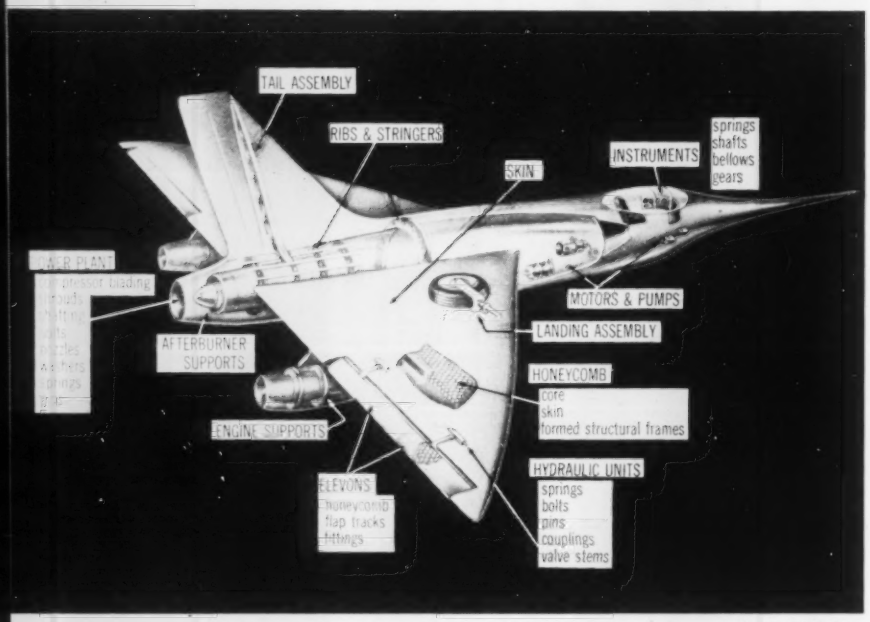
ALTHOUGH the auto industry is the largest single user of stainless, its consumption varies from car to car and year to year, depending on styling trends and costs.

Competition—Stainless competes directly with zinc diecastings and aluminum in most applications. It also fights chrome plated steel—bumpers and quarter panel trim, for example.

In the last five years, stainless has lost out to aluminum in grilles. Ford and Chrysler have switched almost entirely to them.

Trim Trend—A few years ago, the industry went all-out for aluminum wheel covers. But car owners soon found they dented easily. The finish turned dull and spotty. In 1958, almost half the cars will switch back to stainless steel wheel covers.

Four or five years ago, the alu-



Armco Steel Corp.

VYING FOR LEAD—Aircraft may become top stainless user in another five years. Drawing illustrates many typical uses in hot areas of airplanes and missiles

STAINLESS STEEL

minum people were selling trim by saying it could be made to look like stainless. Stainless fabricators are trying to recoup by treating their product so it looks like the duller aluminum finishes.

New Uses—McCord Corp., Detroit, uses 18-8 stainless for top tanks and baffles in radiators.

Ford will switch to 430 stainless in making transmission oil coolers which are placed in the bottom of the radiator.

Cost Ranks High—Material and fabricating costs are still the determining factors in material selection for auto parts. "If we have a choice involving stainless, aluminum, and chromed steel, we'll take the plated steel every time if it will give us the quality we need," explains Dan Adams, body and sheet metal engineer for GM's Cadillac Div.

Future Styling—Jon W. Hauser, auto designer from St. Charles, Ill., foresees the use of stainless structural panels that can double as trim. "We will achieve a decorative effect and eliminate several operations and parts. Stainless can be welded to other structural members; fasteners are no longer necessary. Eliminating duplication of metal thickness will also reduce weight," he explains.

Heavy Duty — In truck and trailer manufacturing, the corrosion resistance of stainless makes its higher cost a minor factor. The most common use: Mufflers.

When stainless was scarce, trailer manufacturers switched to glass lined and coated steels for tank trucks. Several makers now indicate they will turn back to stainless if they can get enough of it. Most trailers made by Fruehauf Trailer Co., Detroit, are aluminum, but it uses stainless for special orders.

AIRCRAFT

Convair is producing the airplane with the most stainless in it—the B-58. Its jet engine is essentially all stainless; many critical areas of the delta wing are brazed stainless honeycomb. All supersonic aircraft use some for structural parts near the hot areas. It's used extensively in jet engines and afterburners.

Extrusion and honeycomb construction are beginning to replace large forgings in aircraft. Smaller no-draft forgings are becoming more common, and thin walled, close tolerance extrusions will be used extensively. Integrally stiffened steel underskins are required for hypersonic aircraft.

Missiles—Only stainless steel or ceramic-coated molybdenum and beryllium can protect the warhead and its instruments from the intense heat generated when ballistic missiles re-enter the earth's atmosphere.

Stainless is used in other critical areas, such as engine linings, exhaust nozzles, roll jets, propellent tanks, and valves. Boeing's Bomarc has an all-stainless fuselage.

Launching platforms are using more stainless as thrusts and temperatures rise. The rocket stand for our earth satellite launching vehicle has solid stainless tripods to hold down the first stage engine during static tests. The jet deflector tubes are made of Type 347 stainless.

Stainless Grades — Precipitation hardening types are used extensively in aircraft.

The 17-7 Type PH is used mainly in sheet form. (Its first application: Ribs and stringers in the F-86 Saber Jet airframes.) The 17-4 PH type has been adopted for many forgings and fittings because of its ease of machining and simplicity of heat treatment.

The newest grade is PH 15-7 Mo stainless, a material that can be mildly or severely worked, then heat treated for varying strengths. Armco says it has three times the creep strength of 17-7 PH.

The delayed transformation steels seem promising for airframe structural uses. Example: Allegheny Ludlum's AM 350. Although it can be hardened by elevated temperature treatment, its best properties are obtained by freezing.

The martensitic steels, such as 410, 420, 422, and modified 430, have high tensile strength with good ductility. Their properties make them promising aircraft materials. Types 303, 304, 316, and 321 also find considerable use in aircraft and missile parts.

A true age hardening steel would be desirable. When solution annealed, it should have the ductility

of the chromium-nickel austenitic types. A simple aging treatment should harden it to strengths given by tempered martensite structures.

RAILROADS

From 1952 through 1956 nearly 40 per cent of the passenger cars delivered by the nation's top four builders had stainless bodies. Twenty per cent used stainless exterior sheathing.

The big builder of stainless cars is Budd Co., Philadelphia. It has been using the material since the early thirties. Several cars built in 1934 are still operating—and have all their original stainless structural parts.

Other Builders — Other major builders are beginning to use stainless. Pullman-Standard Car Mfg. Co., Chicago, is using it for such parts as girder sheets and side sills which are subject to severe attack from corrosion. Both Pullman-Standard and American Car & Foundry Div. of ACF Industries Inc., New York, have used it for exterior sheathing.

Use in transit cars (subway and surface) is nominal, but the market has enormous potential. Weight savings made possible by the high tensile strength of stainless can mean big power savings.

Grade—Type 201 is the big tonnage item in the industry because Budd, which builds nearly all the stainless cars, uses it almost exclusively. It has the corrosion resistance necessary for railway applications, is easily formed by drawbench and brakes, and costs slightly less than the 300 series. Pullman-Standard says it is seriously considering high manganese, high chromium austenitic grades.

Types 201 and 202 are used for structural and trim parts. Where severe forming is necessary, Types 302 or 304 get the nod because of their better ductility in the annealed condition.

Tank Cars—The trend here is away from stainless because of its high cost. Many new coatings which resist the corrosive effects of chemicals and petroleum products carried in tank cars have been developed. When coatings won't do the job, Types 304, 316, and 430 solid and clad stainless are usually specified.

Stainless in Railway Passenger Cars

(Number of cars delivered)

	American Car & Foundry Div.	Budd Co.	Pullman-Standard Car Mfg. Co.	St. Louis Car Co.
1956	35	159	227	376*
1955	72	202	193	16
	170*			288*
1954	83	181	308	230*
	30*			
1953	26	173	62	130
1952	4	75	27	30
	Some stainless used.	All cars made of stainless.	Some stainless used.	Carbon steel only.

*Subway-elevated cars.

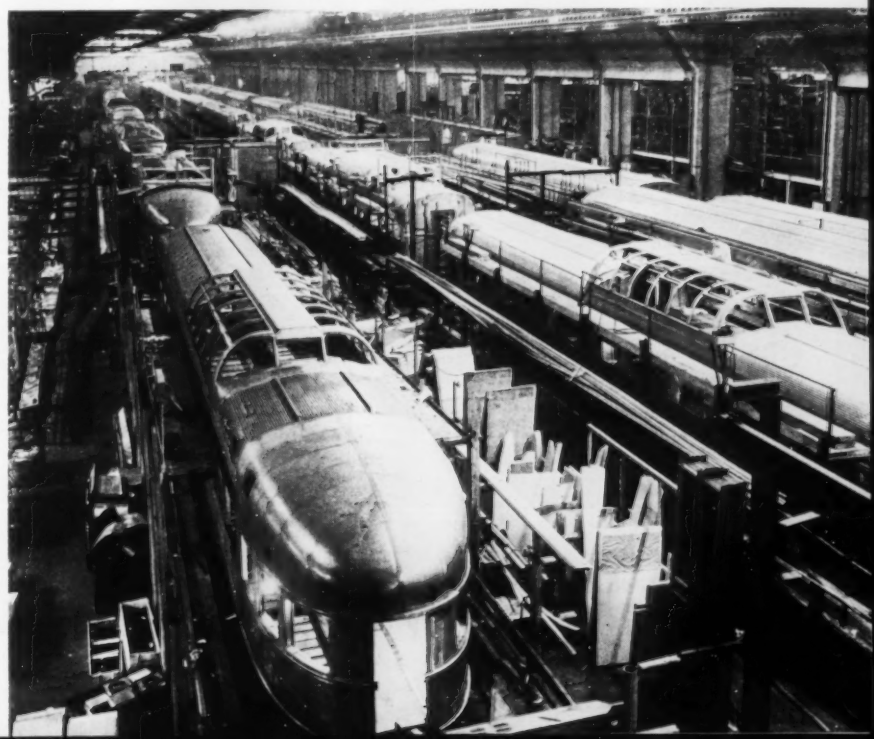
Some covered hopper cars have been made of clad 316 to carry such products as dry chemicals and flour. Contamination of the product is the chief problem.

APPLIANCES

Stainless finds its major use in the home as appliance and furniture trim and in kitchen sinks. As a volume market, sinks are most promising.

Hotpoint Co., Chicago, uses some stainless trim, principally on doors of some high priced refrigerators. The top of GE's kitchen unit—sink, dishwasher, washer, and dryer—is stainless. Norge Div., Borg-Warner Corp., seems to prefer chrome plate. Small appliance makers, like Cory, put out some

ON THE RAILS—The cars that come out of the Budd Co.'s Philadelphia plant are practically all stainless. It's the biggest application for the 200 series. Other builders are using more stainless in their cars



THE LUXURY MARKET—Stainless is competing with silver plate and sterling in such items as this serving platter, gravy boat and tray, and bread tray

STAINLESS STEEL

stainless products, such as coffeemakers, but they're luxury items.

Sinks — The stainless type accounts for about 8 to 10 per cent of all kitchen sinks produced. They are competitive with some of the higher priced conventional sinks. Improved manufacturing techniques and the trend toward lighter gages helped keep the price down. Most common grades used: 18 and 20 gage 302 and 430.

Washer, Dryer — Speed Queen, Ripon, Wis., recently introduced a washer with a stainless tub and a dryer with a stainless drum. Housewife acceptance may influence future use of stainless as a major component.

Stainless has a lot of advantages in the home, but the housewife will probably resist too much of it to avoid the hospital or restaurant atmosphere.

UTENSILS

Cookware and flatware applications represent growing uses. The luxury gift trade is a promising new market.

Hollow trays, platters, and serving dishes have joined the kitchen parade of stainless pots and pans, knives, forks, and spoons, skillets, griddles, bowls, kettles, and other utensils. Stove-to-table casseroles are gaining popularity.

Types — Standard 18-8 chrome-nickel grades are used in most cases for their ease of forming and cleaning. Type 302 is used in greatest volume. Type 202 often replaces 18-8 when price is important.

Producers use Types 410, 420, and 440C for cutlery. Type 304 is used for special deep drawing applications. Types 430 and 301 also find cookware applications.

Laminates — Utensil producers are beginning to use a laminate with a layer of copper between two layers of stainless.

An aluminum company has been experimenting with aluminum between two sheets of stainless. The laminate is lighter and costs less, but bonding is a problem.

FOOD PROCESSING

Modern equipment in the food processing and dairy industries has been made possible by stainless steel, particularly the 18-8 grades.

Refrigerated milk dispensers are the newest use. They are being installed in school cafeterias, restaurants, and other eating places. Scaled down for the home, they will free refrigerator space for other uses.

It is practice to use stainless whenever metal and food are in contact. The material will not contaminate food, or impart flavor, and it looks sanitary.

Type 304 is used in greatest volume, although equipment makers specify significant amounts of 302, 303, and 316. They go into such things as cookers, kettles, vats, vacuum pans, evaporators, heaters, coolers, and juice processors.

HOSPITAL

Hospital equipment is nearly 100 per cent stainless. Ease of cleaning is probably the strongest point. But appearance and resistance to corrosion by chemicals and body fluids are also important. Cost is less an obstacle than it used to be.

One of the newest uses is in medical carts where the less expensive stainless-clad steel can be used. Instrument manufacturers are producing surgical blades from stainless. Many hospitals are going to stainless ultrasonic equipment for cleaning instruments.

BUILDING

The 45-story Socony Mobil Bldg., New York, is a dramatic example of stainless in architecture. Smaller uses, such as building fronts and first floor units, account for the bulk of the tonnage and hold the greatest promise.

Several stainless office buildings are going up, and more are planned. Examples: Union Carbide Corp.'s 50-story headquarters in New York will have a stainless exterior; the 10-story Columbus & Southern Ohio Electric Co. building in Columbus, Ohio, will use 110,000 lb; the Inland Steel and Morton Salt buildings in Chicago will be of curtain wall construction. (The 5-story Morton building will use 320 stainless panels.)

Growth Area — The material is finding increasing use in building fronts, counters, window frames, screens, columns, doors, trim, pipes, wall decorations, railings, sash, jambs, and transoms. It's being used decoratively and functionally. Other uses range from church spires and building domes to telephone booths and signs.

Many miscellaneous construction applications are growing. Manufacturers of ducts used in building air conditioning systems report a swing toward the metal, so do roof and window flashing fabricators. Hardwaremakers are using more of it for hinges, flat springs, runners, and tracks.

Future—Penetration of present markets is the key to the metal's future. More economical designs must be developed to utilize its mechanical and physical properties.

PETROLEUM

Type 304 solid and clad plates have been specified for a giant grease mixer being fabricated for a leading oil company. It is the industry's newest use of stainless. About 10 ft high, it will hold 22,500 lb per batch.

Refiners are interested in the material only when its corrosion resistance and temperature-strength qualities make it economically desirable. (It's being used in the mixer because some grease additives are corrosive at this stage.)

Refiners are in the catalytic reformer building phase of the octane race. It could precipitate the biggest near-term growth of stainless in the industry. The building of units for superfractionation and extraction is expected to be the next phase.

On the Fence—If refiners turn to high pressure equipment for superfractionation, little stainless will be needed. Low pressure equipment would make the metal desirable because of its good strength at low temperature.

Other uses will grow as the industry expands. Refinery vessels and furnace parts represent the biggest use. When corrosion is a factor, vessels often are lined to provide 20-year service. Another major use is for heat exchangers.

TEXTILE

The surface smoothness and corrosion resistance of stainless make it ideal for much textile processing equipment. It finds its greatest use in the wet processes—dyeing and addition of materials from water solution to improve the feel, drape, and stiffness of cloth.

Cloth is continually moved over the surface of treating tubs or tanks; surface smoothness is necessary to reduce wear. It also makes it easier to clean the tanks.

CHEMICAL

The application of many chemical processes has been made possible by the development of stainless grades for them.

An example of this is Carpenter Steel Co.'s No. 20 grade. It was developed specifically to resist sulfuric acid. Type 316 is gaining wide acceptance in hazardous applications. The molybdenum modified grade is being used for valves, pumps, and other working parts in direct contact with chemicals.

Castings and bar stock covering a broad range of specifications are going into solenoid valves used for automatic or remote control, measuring and weighing liquids, emergency shutoff, discharging weigh tanks, and drum filling.

Heavy wall seamless cylinders (containers to hold gases and chemicals under pressures up to 10,000 psi) are being produced in larger volume.

PAPER MILLS

Use has been increasing steadily in this industry, and it will continue to do so. Example: Riegel Paper Corp.'s stock preparation equipment at its new paper mill (Acme, N. C.) is made entirely of Type 316 or lined with stainless. It was built by Black-Clawson Co.'s Shartle Div., Middletown, Ohio.

The large castings and forgings

MILK ON TAP—New use in restaurants is a bulk milk dispenser. The refrigerated units are being developed in smaller sizes for the home

Joseph T. Ryerson & Son Inc.

FUNCTIONAL BEAUTY—Sandwich walls made of galvanized carbon steel sheets, insulation board, and stainless sheets have insulating value equal to that of an 8 in. brick wall. Construction has been used in two big industrial buildings

used in papermaking machinery are mainly Types 316 and 304. When extra hardness is required, as on roll coverings, Type 420 is often used.

Newer applications in papermaking machines include: Coverings on the press and suction rolls, and the large dryer rolls.

Stainless cladding has gained some acceptance as a lining in large digesters in pulp mills. Another factor stimulating demand is the increased use of neutral sulfite semichemical pulping.

LAUNDRY

Practically all commercial washing and dry cleaning machines are made of stainless. Some 1935 model washers are still in operation.

The wood, cast iron, and brass construction of early machines would not permit the use of today's improved cleaning materials. Monel made its debut in the early thirties. It was discarded when stainless came along because it was easier to fabricate.

Some new machines can handle up to 1000 lb of dry clothes.

ATOMIC ENERGY

Here is a growing market for stainless. Reactors and atomic powered machines require its high temperature and corrosion resistance. Nonmagnetic characteristics also can be valuable.

Instruments, measuring, and recording devices are taking substantial amounts, as are chemical plants and laboratories doing atomic work. More will be needed.

Boron Stainless—Modified compositions are being developed to bring out special nuclear properties. Boron additions give properties useful in moderating and shielding the flow of neutrons.

Type 304 containing 1 per cent boron is being used as thermal shield in reactors; 304 with 2 per cent boron is used for control rods.

Marine Uses—In initial work on water-cooled reactors of the type used in the *Nautilus*, 347 was generally chosen as the main material of construction. It offered the maximum degree of corrosion resistance for the environment.

As the project progressed, tests showed that an unstabilized grade such as 304 could be used in many places without danger of intergranular corrosion.

Weldability Important — Types 304, 316, and 347 are being used to fabricate pumps and valves. Selection often hinges on welding characteristics. Type 316, which is better stabilized than 304 and presents less difficulty than 347 is generally described as a "middle of the road" choice. It is being favored in some installations.

One large producer of canned pumps uses 304 stainless welded with 308 rods. Companies building commercial equipment for atomic energy lean toward 304 because it is cheaper.

Future — Users want adequate corrosion resistance, plus a higher yield strength than 304 offers. Endurance limit is also important; structural members may be subjected to many thermal cyclings.

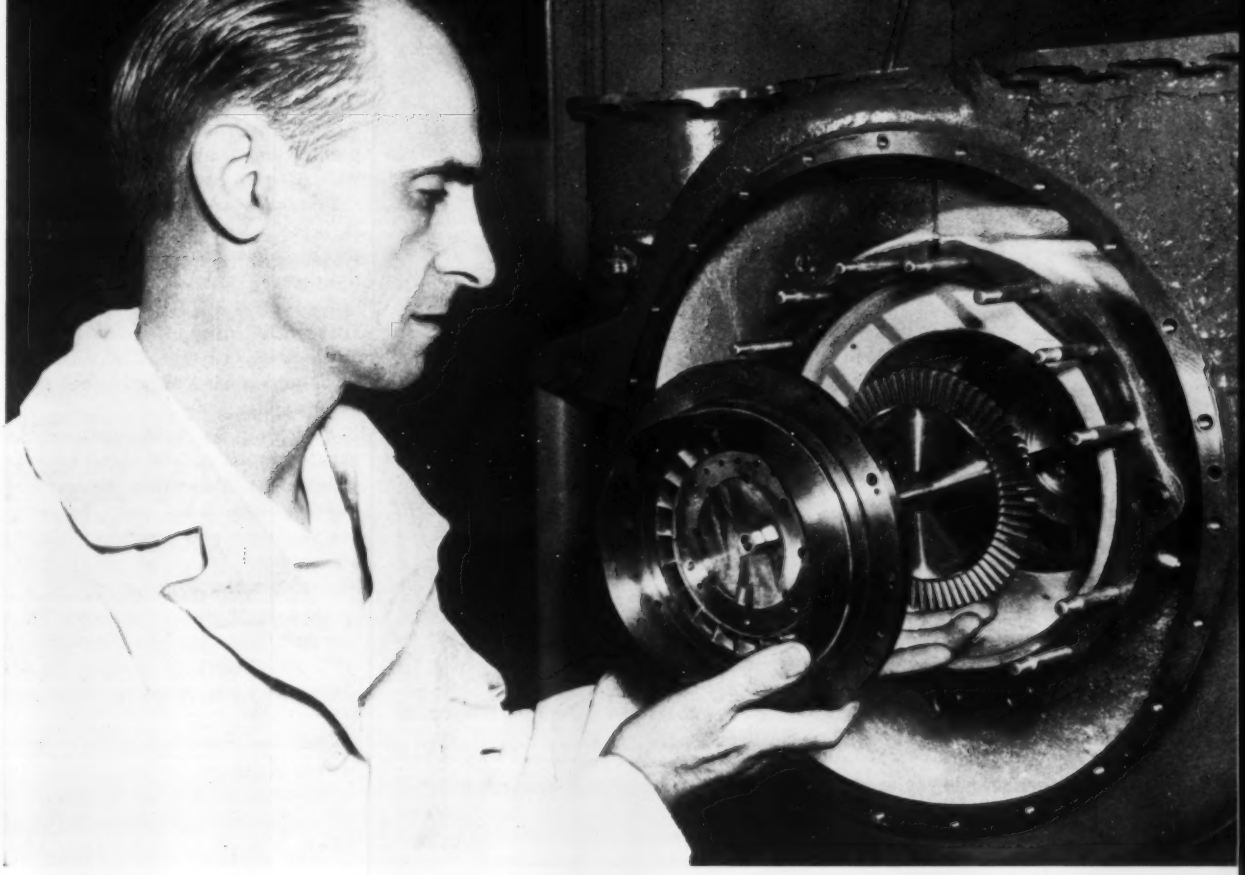
FASTENERS

The use of stainless fasteners is growing. Corrosion resistance, strength, and heat resistance are top considerations.

Applications—The electronics industry is probably the largest single market. Automotive, appliance, and building applications appear to have the greatest potential for immediate development.

Other important applications: Electrical, aircraft, railroad, chemical, food processing, petroleum, pulp and paper, dairy equipment, store and soda fountain equipment, kitchen, and refrigeration.

Most grades are involved. When stainless parts are joined, fasteners of the same type are generally used, making for uniform corrosion resistance and appearance.



METAL FOR HEAT—Chrysler Corp. uses stainless for the nozzle ring and the turbine wheel disc in one model of its experimental gas turbine engine. The stainless can withstand the 1500° F created in the engine's combustion chamber

4 FABRICATION

Users of stainless can choose grades for drawing, machining, welding, and other fabrication processes. Extrusion and stretch forming are gaining acceptance

THE designer should be familiar with the whole family of stainless steels. Intelligent selection can pay off in design improvements and cost savings.

The table on Page 121 lists the 39 standard AISI types. A number of other alloys are available under various trade designations. Many were developed to accent some special properties which the designer may need.

Types—As shown in the table, the AISI types fall into three basic groups: 1. Martensitic. 2. Ferritic. 3. Austenitic. They offer a range of mechanical properties.

For example, the austenitic steels have the best impact properties at low temperatures and best strength at elevated temperatures. Martensitic steels have the highest hardness at room temperature, and a wide range of mechanical properties may be obtained by heat treating.

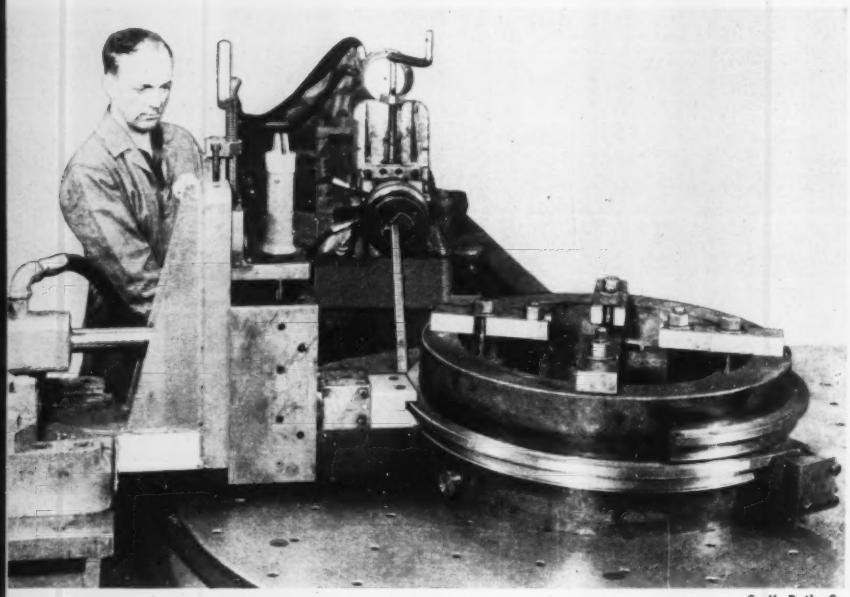
Type 410 is the most widely used of the martensitic grades. Types 420 and 440 are used where greater hardness is needed.

The higher chromium content of ferritic, Type 430 gives it better corrosion resistance than the martensitic grades.

The austenitic types (302 is the most popular) have excellent corrosion resistance. Their austenitic structure gives them good ductility.

The new chromium-nickel-manganese grades 201 and 202 are austenitic types with much lower nickel content.

Corrosion Properties—Generally,



Cyril Bath Co.

STRETCHING TO SHAPE—Automakers are turning to stretch or wipe forming for shaping many stainless parts. They find it's cheaper than press forming, overcomes a large part of inherent springback, and reduces time for changeovers

corrosion resistance varies with the percentage chromium in the alloy. The 18-8s have grown to be a sort of a standard for comparison. They have ample reserve margins of resistance to weather, kitchen, laundry, dairy, and general use.

Type 430 is used almost interchangeably with the 18-8s for many applications. It's highly corrosion resistant, though not to the same degree.

Corrosion resistance of the newer 200 series is in general similar to that of 301 and 302. In most media, it has proved superior to the 400 series. For many applications, it is equal to the 300 series.

Reasons — The designer may choose stainless to meet either functional or decorative needs. The technical reasons for his choice may be found in mechanical, corrosion, or heat resistance requirements of the product.

An equally valid choice may be based on sales appeal. Stainless is a glamour metal. When used as trim it may add little or nothing to a product's function but will do a lot to sell it in competition.

FABRICATION

Many fabricators are turning to stretch or wipe forming. It's cheaper than conventional draw or press forming, and the method overcomes a large part of the material's inherent springback. Other advantages: Simplicity (it reduces downtime for changeovers), low first cost, and versatility.

Automakers are foremost in the move. Ford Motor Co.'s new plant at Sandusky, Ohio, uses several experimental machines made by W. A. Stevens Co., Vidalia, Ga., to form interior and exterior trim. Chrysler Corp., Detroit, has several radial draw formers made by Cyril Bath Co., Cleveland.

Aircraft Trends—The honeycomb sandwich is the outstanding new fabrication method in the aircraft industry. Sendzimir-rolled sheets are being bonded to stainless cores to produce light, strong panels (see STEEL, Oct. 14, p. 116).

Larger forgings and thin-walled extrusions with close tolerances are becoming necessary in today's hot aircraft.

Explosion Forming—This area is getting a lot of attention from researchers. It has many possibilities: 1. Much lower die costs. (The method uses only half a die or none at all.) 2. Deeper formed parts. 3. Higher quality parts. (Early results show more evenly distributed stresses.)

The same method is being tried for extrusions. A billet is fired through a die instead of being pushed hydraulically. Designers point out that extremely thin-walled parts can be made.

Finishing—An important quality in many applications is the ability of stainless to take and hold polishes.

Two avenues to cost savings are frequently used by fabricators: Protective coatings for mill finishes and coated abrasive belts for shop applications.

Finishing by such methods as scratch brushing and abrasive belts hides most fabricating marks. For severe handling and forming, many firms are using stainless with heavy paper or abrasion-resistant plastic coverings.

Shop Methods — Abrasive belts are fast becoming the most widely used shop finishing medium. In addition to hand grinders, there are many new automatic finishing machines for flat and slightly contoured sheets.

Electropolishing is maintaining favor for more intricate parts or those with inaccessible interiors. Some nameplates are deep etched and the grooves filled with paint. Fabricators like the better bond stainless provides for the paint—undersurface corrosion is a widespread cause of peeling.

Fresh Effects—Stylists are continually trying new methods for fresh effects. Translucent porcelain enamels are exceptionally attractive. A number of novel effects have been made by combining them with deeply textured surfaces.

Black etching is widely used for nameplates. Some vending machine makers are etching trademarks directly on cabinet bodies by this process.

Welding—Nearly all fabricators agree that the trend in welding is to automatic methods. Colonial Iron Works Co., Cleveland, explains: "We feel that refinement of fluxes is responsible for the new emphasis. New types maintain correct chrome and nickel concentrations in the weld nugget. Where possible, we use automatic submerged arc welding to join all stainless thicker than 1/16 in."

George Parks, chief welding engineer, Solar Aircraft Co., Des

Moines, Iowa, says that aircraft fabricators also concentrate on finely controlled automatic systems (Mig or Tig). Welds are shielded with helium or argon.

Metal Selection—Carbide precipitation and underbead cracking are problems. Users have a choice of stainless grades that will minimize the hazards: ELC (extra low carbon), columbium, or titanium stabilized grades.

ELC grades give better results for high temperature and corrosive applications when subsequent heat treatment isn't used. Columbium and titanium stabilized grades are used although they require some modification of welding method to overcome crack (notch) sensitivity.

New Method—One welding electrode manufacturer has followed the submerged arc trend with a new method for depositing stainless on base plates of mild or low alloy steel. Two wires are fed continuously in an automatic machine. Alternating current passing between the wires melts the stainless and deposits a wide, heavy bead. The arc is submerged in a granular flux.

The firm says dilution and penetration are kept at a minimum. The method was used on the new atomic reactor vessel at Shippingport, Pa.

MACHINING

Most production men who machine stainless don't work from handbooks, particularly when it comes to speeds.

As E. F. Allred, process engineer, Diversey Engineering Co., a Chicago maker of missile parts, puts it: "The drive to make money soon crowds you away from safe but conservative lower speeds. You learn that with some tool modifications, you can get high speeds and high production rates. From there on it's a matter of refinement."

Starting Point—Here's how he would advise the beginning user: "On one of the tougher alloys, say 347, I'd say begin at about 350 sfpm with a ⅜-in. cut and a 0.025-in. feed. Work up from there."

His starting point is about double what most books suggest. He emphasizes (as do all other users) that there are two musts: Adequate machine horsepower and absolute rigidity of machine, tooling, and workpiece.

"If you don't have them, you're out of contention in the contract business."

Stainless and Heat-Resistant Steels

	AISI No.	C	Mn Max	Si Max	Cr	Ni	P Max	S Max
AUSTENITIC Hardenable by Cold Working	201	0.15 max	5.5–7.50	1.00	16–18	3.5–5.5	0.060	0.030
		Other: N 0.25 max						
	202	0.15 max	7.5–10.00	1.00	17–19	4–6	0.060	0.030
		Other: N 0.25 max						
	301	0.15 max	2.00	1.00	16–18	6–8	0.045	0.030
	302	0.15 max	2.00	1.00	17–19	8–10	0.045	0.030
	302B	0.15 max	2.00	2.0–3.0	17–19	8–10	0.045	0.030
	303	0.15 max	2.00	1.00	17–19	8–10	0.20	0.15 min
		Other: Mo 0.60 max*; Zr 0.60 max*						
	303Se	0.15 max	2.00	1.00	17–19	8–10	0.20	0.06
		Other: Se 0.15 min						
	304	0.08 max	2.00	1.00	18–20	8–12	0.045	0.030
	304L	0.03 max	2.00	1.00	18–20	8–12	0.045	0.030
	305	0.12 max	2.00	1.00	17–19	10–13	0.045	0.030
	308	0.08 max	2.00	1.00	19–21	10–12	0.045	0.030
	309	0.20 max	2.00	1.00	22–24	12–15	0.045	0.030
	309S	0.08 max	2.00	1.00	22–24	12–15	0.045	0.030
	310	0.25 max	2.00	1.50	24–26	19–22	0.045	0.030
	310S	0.08 max	2.00	1.50	24–26	19–22	0.045	0.030
	314	0.25 max	2.00	1.5–3.0	23–26	19–22	0.045	0.030
	316	0.08 max	2.00	1.00	16–18	10–14	0.045	0.030
		Other: Mo 2.00–3.00						
	316L	0.03 max	2.00	1.00	16–18	10–14	0.045	0.030
		Other: Mo 2.00–3.00						
	317	0.08 max	2.00	1.00	18–20	11–15	0.045	0.030
		Other: Mo 3.00–4.00						
	321	0.08 max	2.00	1.00	17–19	9–12	0.045	0.030
		Other: Ti 5xC min						
	347	0.08 max	2.00	1.00	17–19	9–13	0.045	0.030
		Other: Cb-Ta 10xC min						
	348	0.08 max	2.00	1.00	17–19	9–13	0.045	0.030
		Other: Cb-Ta 10xC min, Ta 0.10 max						
MARTENSITIC Hardenable by Heat Treatment	403	0.15 max	1.00	0.50	11.5–13	.....	0.040	0.030
	410	0.15 max	1.00	1.00	11.5–13.5	.....	0.040	0.030
	414	0.15 max	1.00	1.00	11.5–13.5	1.25–2.50	0.040	0.030
	416	0.15 max	1.25	1.00	12–14	.....	0.06	0.15 min
		Other: Mo 0.60 max*; Zr 0.60 max*						
	416Se	0.15 max	1.25	1.00	12–14	.....	0.06	0.06
		Other: Se 0.15 min						
	420	Over 0.15	1.00	1.00	12–14	.....	0.040	0.030
	431	0.20 max	1.00	1.00	15–17	1.25–2.50	0.040	0.030
	440A	0.60–0.75	1.00	1.00	16–18	.....	0.040	0.030
		Other: Mo 0.75 max						
	440B	0.75–0.95	1.00	1.00	16–18	.....	0.040	0.030
		Other: Mo 0.75 max						
	440C	0.95–1.20	1.00	1.00	16–18	.....	0.040	0.030
		Other: Mo 0.75 max						
	501	Over 0.10	1.00	1.00	4–6	.....	0.040	0.030
		Other: Mo 0.40–0.65						
	502	0.10 max	1.00	1.00	4–6	.....	0.040	0.030
		Other: Mo 0.40–0.65						
FERRITIC Nonhardenable	405	0.08 max	1.00	1.00	11.5–14.5	.....	0.040	0.030
		Other: Al 0.10–0.30						
	430	0.12 max	1.00	1.00	14–18	.....	0.040	0.030
	430F	0.12 max	1.25	1.00	14–18	.....	0.06	0.15 min
		Other: Mo 0.60 max*; Zr 0.60 max*						
	430FSe	0.12 max	1.25	1.00	14–18	.....	0.06	0.06
		Other: Se 0.15 min						
	446	0.20 max	1.50	1.00	23–27	.....	0.040	0.030
		Other: N 0.25 max						

* At producer's option; reported only when intentionally added.

Here's how you can cut stainless at practical, competitive rates.

• **Turning** — Authorities recommend a lead angle on the tool, unless you're turning to a shoulder. Throwaways, with their negative

rakes, will work if you boost speeds. Use big tool shanks to get rigidity. Leave at least 0.005 in. of stock for finish cuts.

• **Drilling**—There's a trend toward sharper drill points (one plant uses 90 degrees) with grooves or notches in the cutting edges that will break the chips. Use fairly high feeds to keep the drill from rubbing.

• **Milling** — The trend is toward carbides, except for form cutters where cost would be prohibitive. Flood coolant in from behind the cutters to keep the work area submerged.

• **Tapping**—Use a high hook angle. Most production men prefer the two flute, gun type taps. Try a mixture of white lead and sulfur-base oil for a lubricant.

• **Free Machining Alloys** — The most common ones contain sulfur or selenium. Leaded stainless aims at the same target. Ease of machining is about equal to that of common alloys. Machining experts have few problems with them.

FORGING

Use of large stainless forgings is on the increase. They require less material than several small ones needed to do the same job, and they reduce machining.

Many are going into aircraft. Rings with a 20 to 30 in. OD and a total tolerance of ¾ in. are being made. Forgings are being used extensively for jet engine compressor sections, wheels, blades, and stator vanes.

Civilian Uses — The trend to higher temperatures and pressures in process equipment is causing a switch from stainless to higher alloy materials on some jobs. Others are being upgraded to stainless. Net result: There seems to be no decrease in demand for forgings.

Forgings find wide use in oil fields, chemical industries, coal fields, sewage plants, and other areas where temperature, corrosive conditions, and strength requirements make their use economical. A potential market: Coal hydrogenation plants.

More 201 and 202 are being specified where optimum corrosion resistance is not a factor. Reason: Lower cost.

CASTING

Precision casting methods are growing in importance.

Shell molding is being used more, says the Alloy Casting Institute. High volume parts like valves and fittings lend themselves to the process. Shell molding of light work comes to 10-25 per cent of output at Cooper Alloy Corp., Hillside, N. J. Coreroom work using the CO_2 process has reached 50 per cent.

New Processes—Ceramic mold processes are being investigated by many producers. R. W. de Weese, vice president, sales, Electric Steel Foundry Co., Portland, Oreg., explains: "This process offers substantial promise in the production of castings that will have the quality and surface finish acceptable to the aircraft and guided missile fields."

Another new development is the use of hot, or exothermic, sleeves for open risers. Jobs that could not be done can now be produced practically and economically, says Cooper Alloy.

New Alloys—New casting alloys have been developed to answer the need for higher strength and resistance to corrosion. One is CD-4MCu, which can be precipitation hardened at 800 to 900° F (see STEEL, Jan. 28, p. 95).

The 17-4 PH grade is being cast in both shell and sand molds. The precipitation hardening alloys are being used by valve and pump makers to eliminate galling, reports H. L. McClees, president of Crucible Steel Casting Co., Lansdowne, Pa. Precipitation hardening increases tensile and yield strengths without destroying corrosion resistance.

New Uses—Cast fittings and valves are being used by the nuclear industry as primary loop components in pressurized water reactor systems for 2500 psi service at 670° F, says Cooper Alloy. The firm has introduced a line of Type 304 stainless castings that meets the AEC's standards for x-ray and dye penetrant tests and the 20-minute hydrostatic test at 6000 psi.

The Alloy Casting Institute sees increasing use of stainless castings in nuclear reactors. It's indicative of a general trend toward higher processing temperatures and pressures. In power generation, steam turbines are being run at 1600 to 1800° F.

Up and Down—John McBroom, president of Stainless Foundry & Engineering Inc., Milwaukee, says: "We have noticed a trend toward what may be referred to as superstainless steels. We get more inquiries for these higher alloyed metals."

Also: "Low temperature properties (for around − 270° F) are requested more frequently."

And Around—Sandusky Foundry & Machine Co., Sandusky, Ohio, a centrifugal casting specialist, sees a new use for stainless in suction press rolls for papermaking machines. Also new: Snorkle tubes and radar masts, control mechanism parts for atomic reactors, catalyst baskets for chemical plants, and stator shells for canned motor pumps used with atomic reactors.

A new application for ferritic stainless is in shell molded wear plates for large automotive dies.

METAL POWDER PARTS

Producers of stainless powders run into two sales problems: Fabricators must have a sintering furnace in the 2100 to 2300° F range, and few designers know about the availability of the material.

Keystone Carbon Co., St. Marys, Pa., fabricates parts from Types 316 and 302B powders. Strengths range from 30,000 to 50,000 psi, with 5 to 10 per cent elongation. The parts are used in home appliances, sporting goods, and novelty items.

Other leading applications include filters, cams, bushings, water meter parts, bearing blocks, instrument parts, ordnance parts, and pressure snubbers.

Producers see greater use for molded structural parts and filters. As sintered parts approach 90 to 95 per cent of theoretical density, they show strength and ductility nearly equal to bar stock.

• An extra copy of this article is available until supply is exhausted. Write Editorial Service, STEEL, Penton Bldg., Cleveland 13, Ohio.

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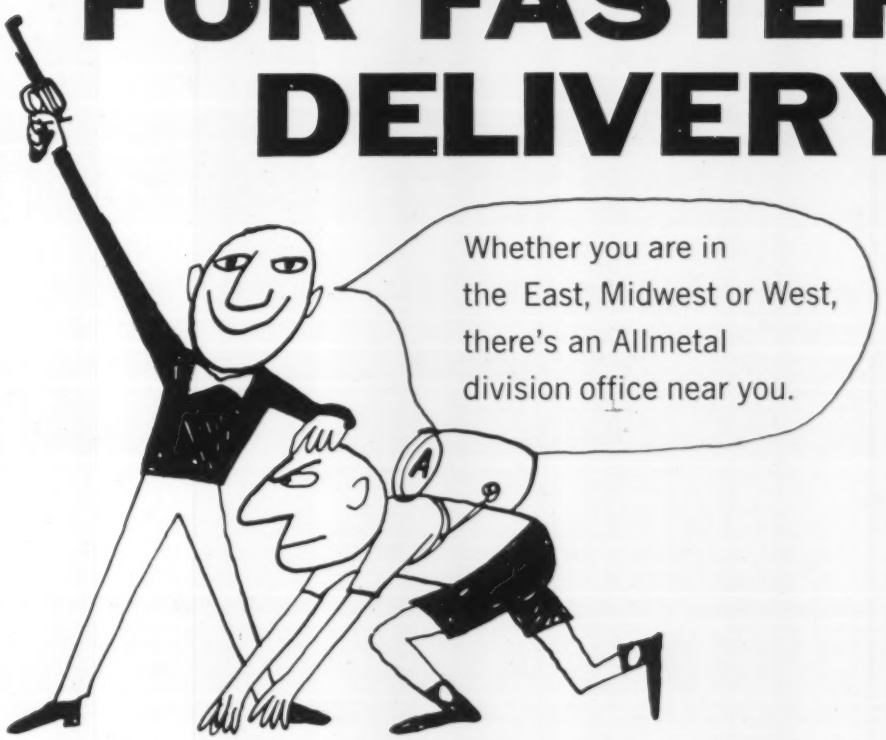

There's no stock like the largest stock, and Allmetal has the largest stock of stainless steel fasteners in the world	Allmetal specializes in all types of stainless steel fasteners, screws, nuts, bolts, washers, rivets, pins, 'AN' fasteners, etc.	Batteries of cold headers and automatic screw machines ready to turn out special fasteners to your specifications.	And if you need stainless steel fasteners, fast!—Allmetal can deliver from stock within 24 hours

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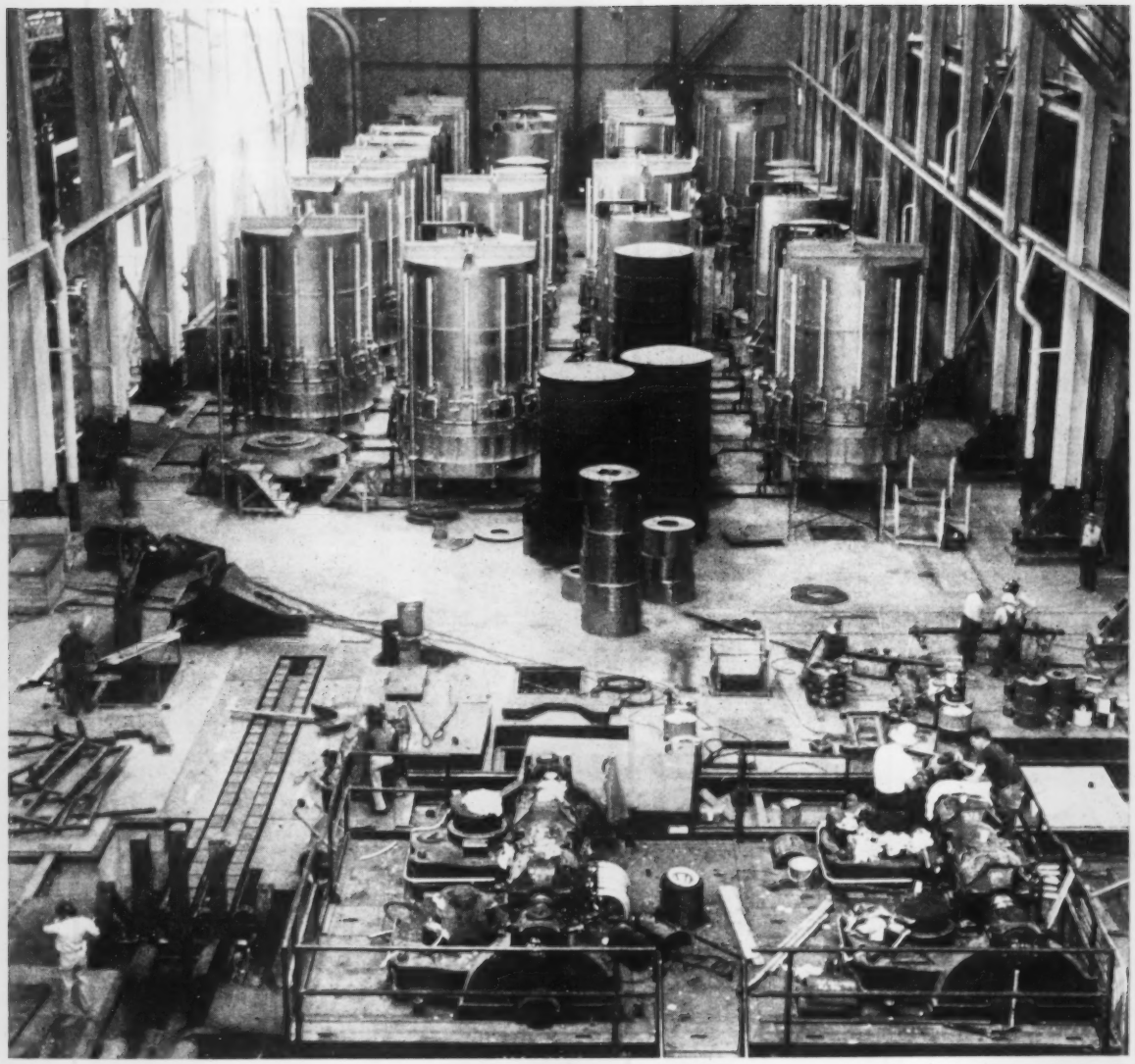

By systematic replacement of tin plate mill facilities, Wheeling Steel . . .

Keeps Output Up As It Rebuilds

BY "moving its equipment like men on a checkerboard," Wheeling Steel Corp. will be able to complete a $30-million improvement program at its Yorkville (Ohio) tin plate mill with practically no loss of production.

Wheeling decided to expand and modernize the facility in September, 1955. It also wanted to speed product flow by eliminating cross-handling. The problem: To install new equipment and revamp production facilities without delaying shipments to customers.

Careful Planning—"We planned our moves until March, 1956. Then we began a systematic renovation of the mill," explains G. A. Scheetz, general manager of the plant. Using plant diagrams, a

HIGH-SPEED CONTINUOUS PICKLING LINES

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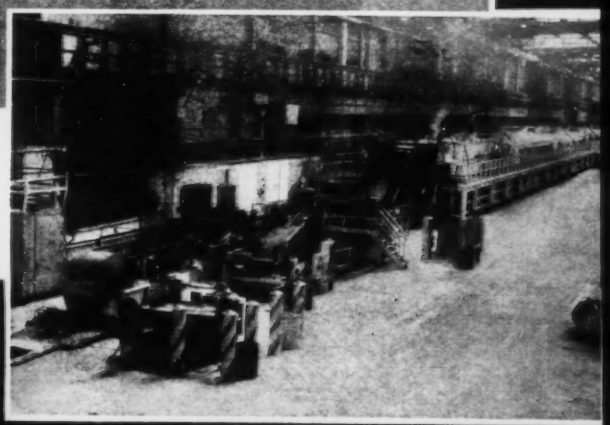

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When you require specific physical properties combined with accurate dimensions in spring steel, call Sandvik.

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Sandvik supplies cold rolled specialty strip steels —

- **In special analyses for specific applications.**
- **Precision-rolled thicknesses to fit your requirements.**
- **In straight carbon and alloy grades.**
- **Annealed, unannealed or hardened and tempered — scaleless or polished bright, yellow or blue.**
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Gives Specific Data On Sandvik Cold Rolled and Hardened and Tempered Strip Steels. Catalogs leading types by application and lists finish, usual size range and chemistry. Send for your copy today.

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Sandvik Quality Steels

priority system was established. Each improvement was made with little or no production loss.

Three groups of annealing furnaces were installed. The first group was put in place without interrupting annealing operations. Temporary furnaces replaced existing capacity when the second and third groups were installed. They were put in an area where annealed coils were stocked.

Wheeling plans to relocate furnaces and bases step by step. The portable units are sized to anneal 72 in. coils, with a maximum stack height of 168 in. Some 20 furnaces and 59 bases were purchased for the installation. Ten cooling covers were provided to speed up cooling of annealed stock.

Moving Job—In many cases, relocation of equipment was necessary before new units were installed. Example: To install a new, 5-stand tandem mill, motor generator sets for a mill had to be moved. The move was made during a weekend when the mill was not scheduled to operate.

In the few cases where production has been lost, Wheeling's flexibility of operations has proved valuable. Example: Pickling operations will be reduced for about seven weeks during the dismantling of a pickler. While a high speed, continuous pickler is being installed, Wheeling's nearby Steubenville, Ohio, plant will lend a hand.

New Equipment—When the program is completed (by the end of the first quarter of 1958), Yorkville will have a 48 in., 5-stand tandem mill to cold reduce hot strip. A new 5000-fpm temper mill will process wide strip in coils.

A modernized machine shop and a new roll shop are in operation. The increased demand for tin plate and black plate in coil form has brought about installation of a third side trimming and recoiling line. One of the two electrolytic tinning lines will be equipped with coilers to supply canmakers with electrolytic tin plate in coils. Wheeling will also install a new electrolytic cleaning and scrubbing line; two lines will be modernized.

A Conco engineered Crane is **top management's** idea of value. Quality like this means minimum maintenance cost, slow depreciation, tailored-to-the-job engineering, reduced accident hazards. Conco engineered Cranes reflect the more than 37 years experience that lies behind them. Write for bulletin 5000A covering the complete line of Conco cranes, hoists and trolleys.

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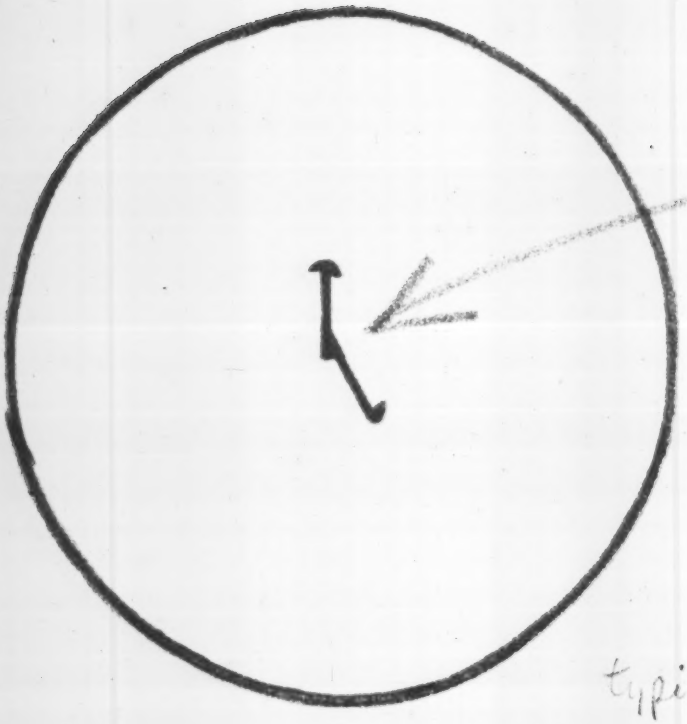


typical extrusion die

MEL-TROL

Until now, it's never been possible to look at an alloy bar or disc and be sure its center is as sound as its surface. Sometimes centerline weakness won't show even in a cross section. But it *will* show in rejects, breakage, rapid wear. The extrusion die illustrated is just one example.

High alloy or high carbon steel bars and discs made by conventional steelmaking practice are subject to poor toughness and erratic properties at the core. The cause is inhomogeneity—segregation, porosity, weakness—that occurs in the ingot while it is freezing.

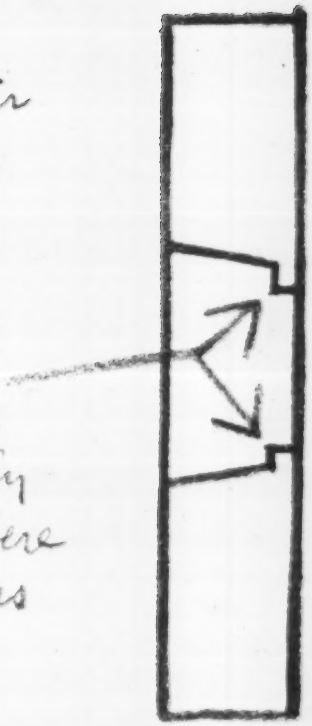
Composition of the steel, purity, pouring temperature and ingot mold design all affect core quality. Core defects cannot be entirely eliminated by rolling and processing of mill shapes. They remain in the core of the bar, and may vary from major defects such as internal cracks, porosity and center segregation to subtle differences in mechanical properties and service behavior between core and surface material which are virtually undetectable before machining or before a part fails in service.

The Mel-Trol process eliminates the problems of inhomogeneity by eliminating their causes.

Mel-Trol is an organized system of extra time, extra care, extra effort—perfecting the steelmaking process to its very greatest efficiency.

Quality control begins with scrap analysis, follows through the melt, casting the ingot, through rolling, annealing—all the mill processes that prepare Carpenter alloys for you—the user. Mel-Trol uses exclusive,

If bar from which die is made has any center porosity, segregation or weakness, die may break, because pressure is centered where these faults concentrate. That is why Mel-Trol alloys are proving superior to regular steels on this higher demanding application. Mel-Trol alloys are uniformly strong at core. Strength is always where it's needed because the Mel-Trol process virtually eliminates possibility of centerline weakness.



Enlarged side view section

new metallurgical achievement that is producing uniformity never before available in specialty steels

Carpenter-developed quality control tools and procedures along with the most modern equipment commercially available.

Mel-Trol gets results because—every *quality control tool and procedure used is used to its fullest capability—nothing less.* A typical example: Fuel injection nozzles which are exhaustively tested after machining. When the manufacturer switched to a Mel-Trol alloy, rejects dropped from an average of about 7 per 1,000 to only 2 in 90,000.

Ask the Carpenter representative who calls on you about Mel-Trol. A selection of superior tool and die steels and elevated temperature alloys produced by the Mel-Trol method is available now—from Carpenter.

Carpenter

The Carpenter Steel Company, 139 W. Bern St., Reading, Pa.
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Pioneering in improved specialty steels through continuing research

Ford Sells the Building Block

The idea of standard dimensions for machine tools hasn't died. In fact, a Ford spokesman says, the concept is already through the first two of four necessary stages

THE DRIVE to standardized machine tools advocated by engineers at Ford Motor Co. is well underway, says a company spokesman.

At a recent closed meeting in the Pentagon, H. C. Daum, manager, machining process department in Ford's manufacturing engineering office, told Air Force officials the "building block" program will be brought about in four stages.

Two To Go—The first step is to stimulate interest among builders. "This we have done."

Next, general specifications for in-line transfer machines had to be published. "Our purchasing activity now attaches copies of such specifications to all quotation requests for such machines." (Ford's new Lima, Ohio, plant features machines bought with building blocks in mind.)

The third step, now in the works, entails development of more detailed specifications for "industry-wide standards for mounting patterns of the major components . . . required to construct nearly all production machine tools."

Finally . . . "We propose standardization of physical dimensions for spindle heights and mounting dimensions of manufacturers' power units. Such standardization will be developed in conjunction with machine tool builders."

Objection—At best, industry-wide transition to standardized dimensions will go slowly. The builder who likes to boast that his "hexagonal ways are flutter-free" is likely to be difficult to coax into camp.

Ford knows this. Mr. Daum says: "We would be the last people in the world to desire the freezing of machine tool design."

But he adds: "We are sure that the industry will be . . . responsive in meeting the changing requirements which the future is bound to bring."

How To Sell

Should machine tools be sold through distributors or direct sales staffs?

The question, always a "hot potato," was discussed by a panel of machine tool builders at the annual meeting of the National Machine Tool Builders' Assn. at French Lick, Ind.

Advocates of direct sales staffs cite advantages of control, continuity, and concentration.

Walter K. Bailey, president, Warner & Swasey Co., Cleveland, put it this way: "We feel selling is a management problem and should not be delegated."

Frank Hayes, vice president, Bullard Co., Bridgeport, Conn., added that increased complexity of customer products calls for more complex sales engineering solutions that can best be handled by factory trained specialists.

K. M. Allen, executive vice president, Rockford Machine Tool Co., Rockford, Ill., pointed up an advantage in distributor selling. His company uses 38 distributors with 190 sales engineers. Assuming they spend only 20 per cent of their time on Rockford products, they are the equivalent of 28 full-time men, a force few small companies can afford.

A variation in distributor selling was brought out by Ralph J. Kraut, president, Giddings & Lewis Machine Tool Co., Fond du Lac, Wis. His company gets the coverage it wants by using distributors, but it retains control by having dealers work through five sales districts, each with a direct company sales staff.

Space Welding

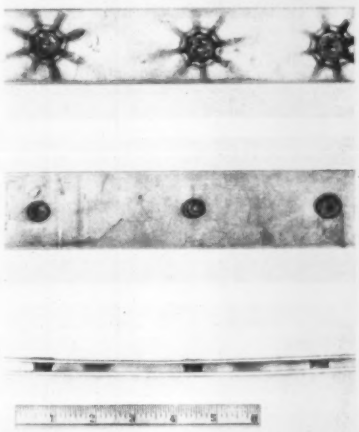
It's done with a portable spot-weld gun. Nuggets are spacers. Assemblies are strong

THE method illustrated below is a new way to join two sheets with a gap between them, says the Linde Co., a division of Union Carbide Corp., New York.

Called space welding, it's said to be economical in the construction of heat exchangers and metal sandwiches.

Method—It's unlike projection or plug welding. No contact is required between sheets, and projections or holes for plugs are not necessary. Removable spacers separate sheets during welding.

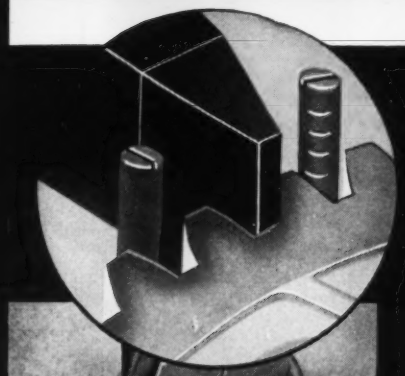
The tool is a standard Sigma spotwelder, using argon shielding gas. Wire feed is delayed until the arc melts a hole in the top sheet and molten metal fuses with the lower one. Metal continues to build up until it fills the hole and fuses with the top sheet.



SPOTWELD METHOD
. . . joins spaced sheets economically

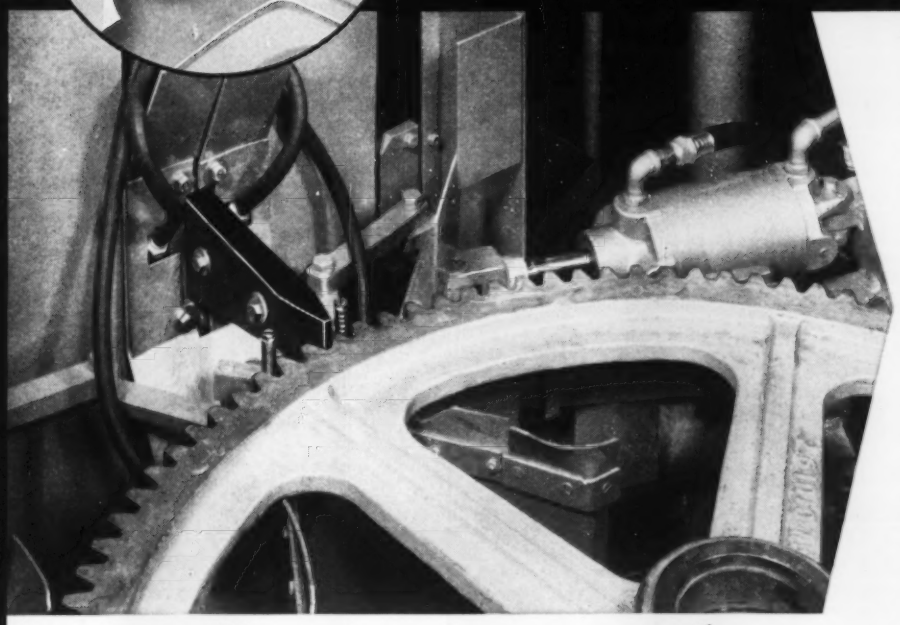
Strong — The assemblies are rigid. When two 1/16-in. carbon steel sheets are space welded, it takes a force of 412 lb to deflect them ½ in. A single ⅛-in. sheet can be deflected the same amount by a force of only 212 lb.

Space welded assemblies also have greater bursting strength than those made by projection or plug welding, says Linde, which makes the spotweld gun.



LOOK TO THE ROOT

FOR IMPROVED GEAR PERFORMANCE



tooth by tooth Gear "Hardening"

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Heat treating the critical root zone makes an appreciable difference in physical properties and fatigue strength.

With high frequency induction heating, the tooth can be full hard for maximum wear resistance. Large gears can be hardened with small capacity equipment.

Scanning eliminates the need for inductor change with varying gear face widths. Automatic controls, including indexing and quenching, result in a high production rate and uniform results.

This is one type of gear hardening. Size and production rate dictate to a great degree the type of equipment. Whatever your need in gear hardening or other heating applications, Magnethermic's experience with induction heating can be useful.

Prompt response to your inquiry — Magnethermic, Youngstown, Ohio.

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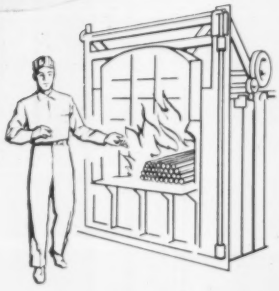

Standard Welded Stainless Pipe and Tubing is formed from only the finest strip steel with every emphasis on uniformity and quality. It is welded by the inert gas shielded arc process. No flux or filler metal is added. Then fully annealed to eliminate stresses and assure uniform structure and maximum resistance to corrosion.

Standard pipe and tubing is produced in a wide range of sizes and grades. Bring your stainless tubing problems to STANDARD . . . rest assured you'll get only the *highest STANDARD* in welded tubing and pipe.

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Evaluating the new Ti-4Al-3Mo-1V sheet alloy . . .
Distribution of lead in leaded steels . . .
Effect of heat treatment on 431 stainless . . .
Stress-rupture properties of chromium . . .
Effect of temperature on airframe aluminum . . .

What's New in Metals

Those attending the National Metal Congress in Chicago this week will hear these subjects in technical sessions. Here is a cross section of ASM papers

Leaded Steels

Machinability of Type A Leaded Steels—There are subtle microscopic differences in lead or lead compound particles in high sulfur steels. The relative mass of the lead particles is affected by the rate of solidification of the parent ingot, association or lack of association with other nonmetallics, and the malleability of the sulfides.

The machining uniformity of Type A leaded steels is subject to the same chemical composition variables that affect the machinability of nonleaded, open hearth, free cutting steel.

Oval sulfide inclusions increase the machinability of leaded steels and stringerlike nonmetallics seem to decrease it.

The bulk of lead in the steels occurs as envelopes or sheaths associated with the sulfides. The mass of the lead tails is, to some extent, dependent on sulfide malleability. The machinability rating variations within Type A steels may be the result of a size effect, with both fine stringerlike sulfides and corresponding fine lead tails being unfavorable.

Because of the interdependence of sulfide and lead particle size, however, the size effect of inclusions is not considered to be conclusive.

Decreased carbon and silicon favor the formation of oval sulfide inclusions with correspondingly massive lead tails and are beneficial to the cutting quality of Type A stock. Machinability is increased by lower manganese contents.

Exclusive of inclusion variation, lead and sulfur appear to have a similar beneficial effect of about + 1 index point per 0.01 per cent increase of the element. Phosphorus and nitrogen do not appear to influence the quality of Type A steel.—E. J. Paliwoda, Jones & Laughlin Steel Corp., Pittsburgh.

Morphology and Chemistry of Lead in Leaded High Sulfur Steels—Microradiography is a useful tool for investigating the morphology of leaded steels, especially when used in combination with standard metallographic methods.

An experimental ingot of leaded, high sulfur steel was examined by microradiography in both the as-cast and hot-rolled conditions. It appears that virtually all the lead can be revealed by the technique.

The distribution of the lead in the as-cast ingot closely follows that of other segregating elements, particularly sulfur. This is a result of mechanical processes occurring during freezing which force lead and nonmetallic inclusions (such as manganese sulfide) into the same interdendritic areas.

X-ray and electron diffraction tests show no evidence of lead compounds. The lead is present largely in the elemental form. The close association of lead with manganese sulfide apparently is not a result of chemical reaction or mutual solubility at elevated temperature.

The distribution of lead and the size of lead particles is a function of the time required for solidification in relation to the settling rate of lead particles.

Rolling elongates the manganese sulfide inclusions and at the same time forces the associated lead particles to each end of the inclusion where they exhibit the typical appearance of lead sheaths or "tails."—J. W. Thurman and E. J. Paliwoda, Jones & Laughlin Steel Corp., Pittsburgh; E. J. Duwell, Minnesota Mining & Mfg. Co., St Paul.

Stainless Steels

Effect of Microstructure and Heat Treatment on the Mechanical Properties of Type 431 Stainless—Many critical applications in chemical equipment, aircraft, and ordnance require a material with high strength and good corrosion resistance.

Frequently, the strength requirement rules out austenitic and ferritic stainless steels and it is necessary to use one of the martensitic grades. AISI Type 431 (16 per cent Cr, 2 Ni), is one of the most potentially attractive steels in this class because it has the highest corrosion resistance of this series of alloys and mechanical properties equivalent to those of low-alloy steels with about the same carbon content.

However, a number of factors have restricted the widespread use of the material.

1. The rapid drop in hardness over a narrow temperature range makes it difficult to control the hardness by heat treatment.

2. The ductility in the trans-

verse direction of forgings is particularly poor at high strength levels.

3. Most commercially produced Type 431 stainless steel contains an appreciable amount of delta ferrite as a microconstituent.

Studies were made to determine the effect of microstructure and heat treatment. Four conclusions were reached:

1. The transverse reduction of area of Type 431 is considerably improved at high strength levels when the steel does not contain ferrite stringers. This should apply also to other hardenable stainless steels.

2. Fracture occurs in the ferrite stringers and results in high stress concentrations in the tempered-martensitic matrix.

3. The transverse ductility is also sensitive to the quenching temperature, reaching a low value in ferrite-free steel when the austenitizing temperature is one at which a grain-boundary precipitation of carbide occurs.

4. Retained austenite reduces the yield strength of this steel. This effect can be minimized by a refrigeration treatment.—G. E. Dieter, E. I. du Pont de Nemours & Co. Inc., Wilmington, Del.

Influence of Nickel on Intergranular Corrosion of 18 Per Cent Chromium Steels—Types 304 and 430 steels can be relatively immune to intergranular attack or made susceptible (sensitized) through selected heat treatments.

A specific heat treatment makes one steel immune and the other susceptible. Another specific heat treatment results in the reverse situation.

The question arises: At what nickel content does the "switch" occur? The purpose of this study was to determine where the division or transition in the mechanisms of intergranular corrosion occurs and also the heat treatments required for optimum corrosion resistance.

Type 304 stainless steel is made susceptible to intergranular corrosion when heated at 1200 to 1400° F. That heat treatment imparts resistance to intergranular corrosion for Type 430 steels.

Quenching from 1900 to 2000° F provides optimum resistance to Type 304 but makes Type 430 susceptible to intergranular corrosion. The major compositional difference in these steels is nickel (8 per cent in Type 304, none in Type 430).

Alloys containing intermediate nickel compositions were cast, rolled, heat treated, and tested to determine the influence of this element on corrosion behavior. It was found that the transition occurs at about 2.5 to 3 per cent nickel. Steels with higher nickel should be heat treated like the austenitic steels and those below like the ferritic steels.

An unexpected result was the good resistance to intergranular corrosion of all of these alloys when water quenched from 1400° F.—Lt. J. R. Upp, Wright-Patterson Air Force Base, Dayton, Ohio; F. H. Beck and M. G. Fontana, Ohio State University, Columbus, Ohio.

The Metal Selector

Did you get your copy? Published in the Metal Show issue (Oct. 28) of STEEL, it compiles data on types, uses, and availability of: 1. Wrought and casting copper alloys. 2. Wrought and casting aluminum alloys. 3. Ferrous castings. 4. Magnesium. 5. Titanium. 6. Zinc diecasting alloys. 7. Alloy and H-steels. 8. Stainless and heat resistant steels.

You can get a copy free by writing Editorial Service, STEEL, Penton Bldg., Cleveland 13, Ohio. Request: "The Metal Selector." For quantities, the price is 10 cents a copy.

Carbide Precipitation and Brittleness in Austenitic Stainless Steel—Austenitic stainless steels lose ductility when deformed at high strain rates.

To determine whether carbide precipitation is responsible for high speed embrittlement in stainless steels and to characterize the relationship of ductility with strain rate and temperature of deformation, tensile tests of annealed and sensitized austenitic stainless steels of varying carbon content—Types 304 ELC (0.024 C), 304 (0.060 C), 302 (0.09 C)—were conducted over a range of temperatures and strain rates. Conclusions:

1. At low strain rates, the steels exhibited a maximum in tensile ductility at room temperature as the test temperature was varied from −321 to 500° F.

2. At high strain rates, the steels gained steadily in ductility as the test temperature was increased.

3. At constant temperature, the steels lost ductility as the strain rate increased; the greatest loss occurred at room temperature.

4. The amount of martensite formed during deformation cannot be correlated with the ductility.

For the sensitized material:

5. The degree of sensitization was a function of the carbon level. Type 304 ELC was not embrittled, whereas Type 304 was embrittled but less than Type 302.

6. Carbide embrittlement manifested itself primarily in the range of low temperatures at low strain rates.

7. The carbide-embrittled specimens fractured intergranularly.

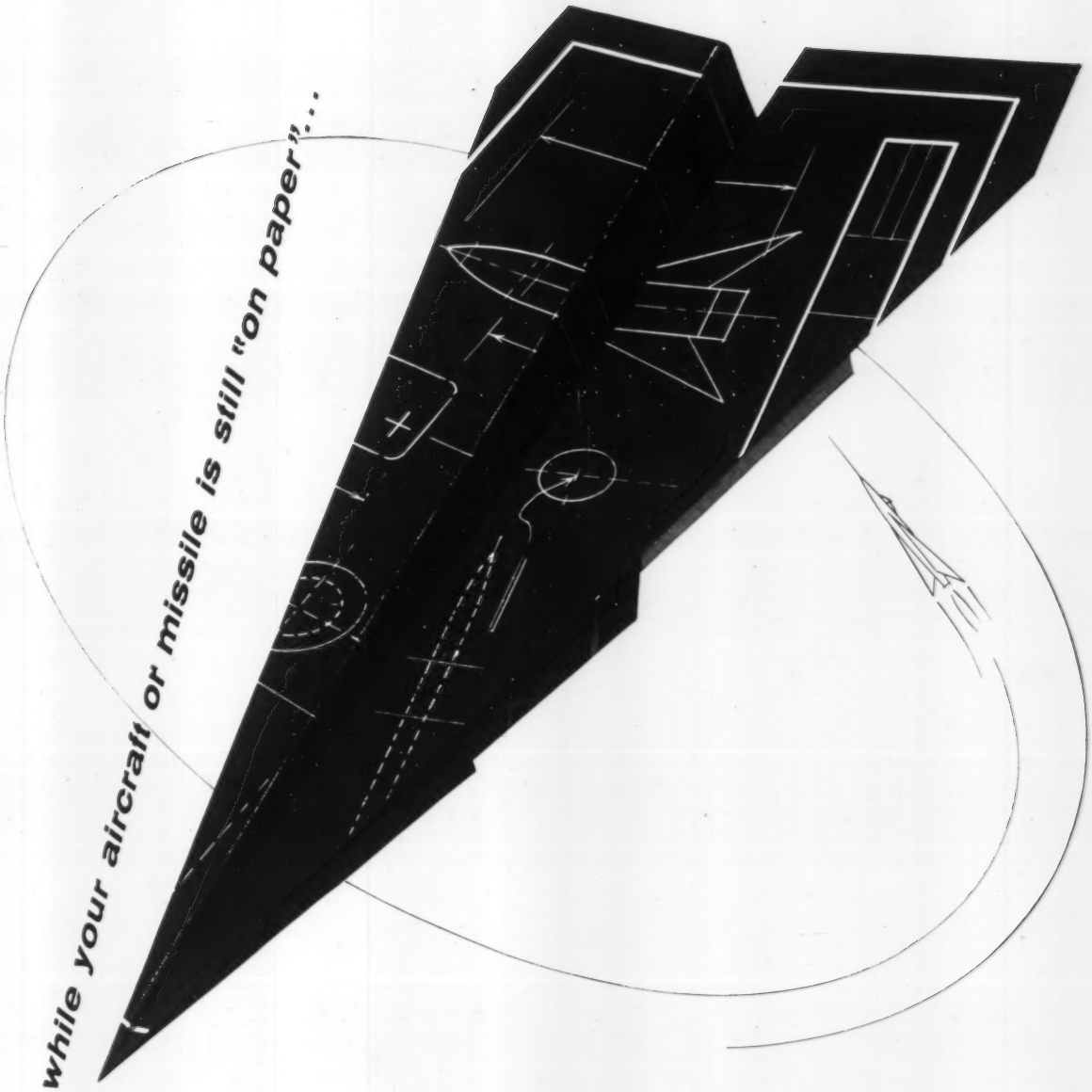
8. Carbide embrittlement cannot account for the high speed embrittlement which is characteristic of austenitic 18-8 stainless steel as a class.—A. Kramer and W. M. Baldwin Jr., Case Institute of Technology, Cleveland.

Chromium

Tensile and Stress-Rupture Properties of Chromium — Chromium-base alloys may become important high temperature materials. Chromium is abundant, has a moderately high melting point and excellent oxidation resistance.

Chromium is easily arc melted and fabricated by extrusion and swaging if the melting stock is first purified at 2900° F in pure, dry hydrogen. Processing raises the oxygen and nitrogen levels significantly above those obtainable after hydrogen purification.

These impurities probably do not



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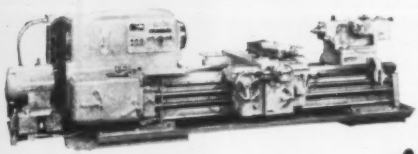
said the chip...

"I do a tale unfold"

This lathe chip, like many, many others, will go to the scrap pile. But there can be gold in the story that it tells.

Its color, size and shape pose questions like these: Is too much heat being generated by excessive speed, thereby causing short tool life and work distortion? Is speed too low, with resultant production loss? Is the rated horsepower of the machine too low or possibly too high for the expected metal removal? Is work finish unsatisfactory? Compressed into one overall question, is the inbuilt productiveness of the machine being realized on every cut of every part, day after day?

There's one certain, affirmative answer. Use Monarch's ultra-modern lathes—the Series 62 Preselector Dyna-Shift; the Series 80 and 90 Heavy Duty Dyna-Shift; the Series EE Model 1000. Chips from them are daily unfolding tales of increased output and lengthened tool life. It's quite possible the lathe chips in *your plant* would tell a story of real cost reduction, if "Made By Monarch". *The Monarch Machine Tool Company, Sidney, Ohio.*



You've never seen another machine like the Monarch Dyna-Shift Lathes with their "thinking headstocks." The Series 90 (above) is typical of a complete range of sizes featuring the Dyna-Shift way to reduced turning costs.

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affect the properties at the higher temperatures. However, they may be important to strain-aging, and they certainly affect the ductile-brittle transition temperature, which is about 600° F.

Increased room temperature hardness results from treatments at 1600 to 2800° F. This may be caused by increased nitrogen in solution. It is not likely that this modifies the properties perceptibly, since the solution of nitrogen would only take place at test temperatures above the range where nitrogen is expected to be effective.

No yield points were observed in the tensile flow curves, but the characteristic temperature dependence of the tensile parameters suggests strain-aging. Yield points may be expected at temperatures lower than 600° F, and should be produced by chromium having a lower transition temperature.

A comparison of the tensile and rupture properties of chromium with those of molybdenum and tungsten is an impressive demonstration of the relationship between strength and melting point. More fundamental relationships, such as that of the heat content at the melting point, undoubtedly exist, as they do with hot hardness.

Chromium has a detriment or an advantage which is reflected by its melting point.

It is reasonable to expect chromium alloys to be most useful in a range below that of the higher melting refractory metals and above that of iron-nickel-cobalt base alloys.

It is estimated that chromium alloys, when they are developed, will be used mainly in the 1600 to 1800° F range for those applications which utilize the remarkable oxidation resistance of the metal. —J. W. Pugh, General Electric Co., Cleveland.

Aluminum

Effects of Temperature-Time Histories on the Tensile Properties of Airframe Structural Aluminum Alloys—Increased airframe operating speeds create an important need for information relating the

At the Rock of Ages granite quarry in Barre, Vermont, a derrick with a bucket platform is used to lower crews to the bottom of the 360-foot quarry. With the lives of scores of men at stake they know that they can...

...lower away in safety

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effects of service temperature-time-stress histories to the mechanical properties of metals.

In this work, generalized expressions have been developed for the tensile properties of 7075-T6 and 2024-T3 alclad sheet.

To obtain these, tensile tests were made at room temperature, 200, 300, and 400° F after single and sequential exposures sampling the temperature ranges of 300 to 600° F (2024-T3) and 250 to 500° F (7075-T6) and the time range of 0.1 to 1000 hours.

Normalization and generalization procedures were applied to the yield and ultimate tensile strength data, using semi-empirical parameters based on the rate-process theory. Statistical calculations were made to determine the degree of conformance of test data and generalized equations.

The conclusion was reached that the yield and ultimate strength generalized equations are adequate for analyzing the effects of those service time-temperature exposure histories within the range of room temperature to 500° F and 1.0 to 1000 hours, and the room temperature to 400° F tensile strengths of subject airframe alloys. — R. E. Fortney and C. H. Avery, Northrup Aircraft Inc., Hawthorne, Calif.

Relation Between Constitution and Ultimate Grain Size in Aluminum – 1.25 Per Cent Manganese Alloy 3003—The grain size of annealed sheet of the aluminum alloy containing 1.25 per cent manganese (3003) is distinctly related to the thermal history of the material.

If ingot produced by the semi-continuous, direct chill method is given a high temperature homogenization heating, known as a "preheat," before hot rolling, it is not difficult to obtain a fine grain size with normal control.

Omission of the homogenization treatment leads to an undesirably coarse ultimate grain size. It was considered important to the fundamental understanding of grain size control to investigate the manner in which the constitution of the alloy was related to grain size.

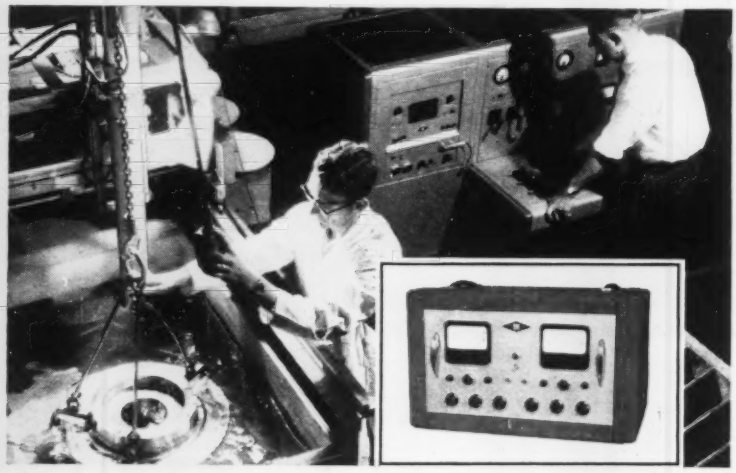
The major microstructural difference between wrought products from 3003 aluminum alloy ingot which has or has not been given a high temperature homogenization heat treatment lies in the greater quantity of fine precipitate particles in the latter.

This high concentration of constituent particles leads to a modification of the normal recrystallization process in a manner which favors the formation of coarse recrystallized grains. The grain size in either case is a function of the recrystallization process only.

The highly concentrated precipitate imparts slightly higher strength, in addition to its effect on recrystallization behavior and grain size. — Philip R. Sperry, Kaiser Aluminum & Chemical Corp., Spokane, Wash.

Titanium

Evaluation of New Titanium-Base Sheet Alloy, Ti-4Al-3Mo-1V—With increasing uses for titanium and its alloys in high-speed aircraft, a higher strength titanium sheet al-



Curtiss-Wright Ultrasonic Metal Testing Insures Quality Control

Nondestructive Test Equipment Inspects Critical Alloy Parts for Thompson Products

Under high stress conditions of jet aircraft and engine components, slight inclusions could become defects. To safeguard against flaws in high alloy turbine wheels, Thompson Products Company uses Curtiss-Wright Ultrasonic Test Equipment. High frequency sound waves become unerring flaw detectives.

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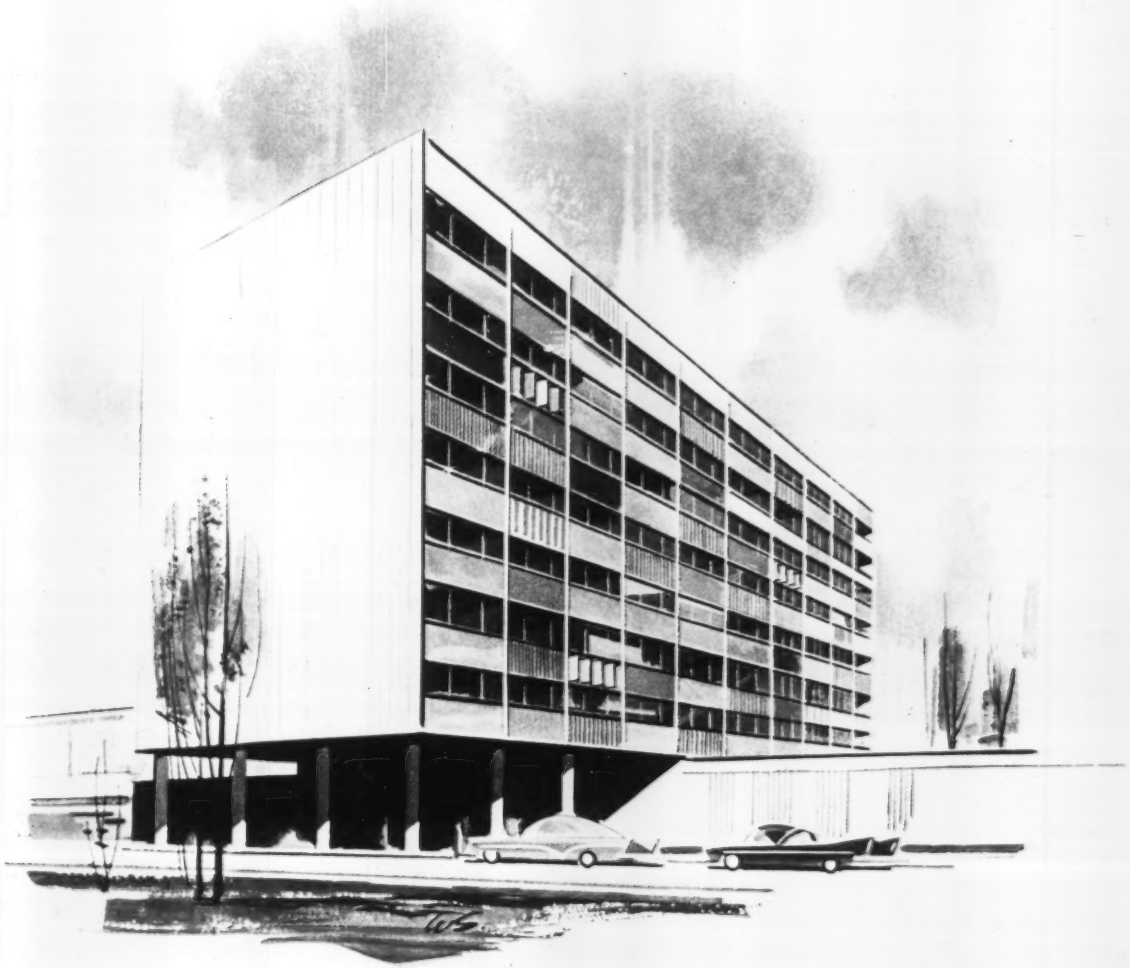

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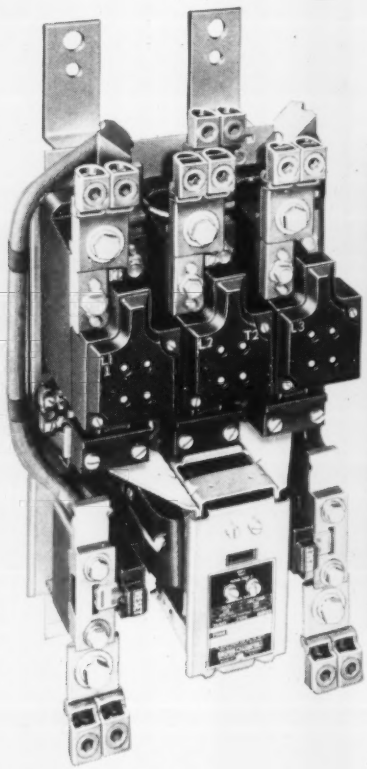

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DESIGN LEADERSHIP FEATURES IN SQUARE D's COMPLETE LINE OF VERTICAL ACTION STARTERS—SIZE 0 through 5

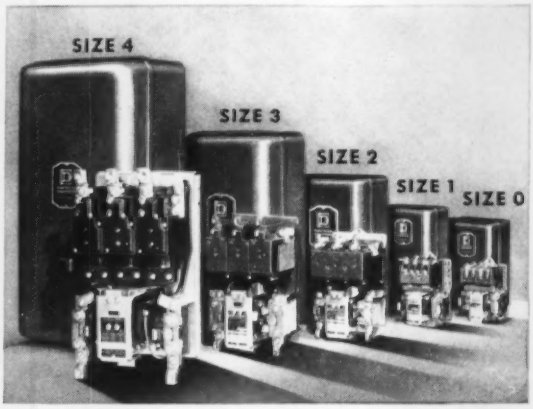
What's most important in a motor starter?

Performance and **long life** come first, naturally—and Square D's straight line guided motion and heavy-duty silver alloy contacts assure both. But that's only the beginning—

Fast wiring is important, too. Square D gives you a lot of wiring space and time-saving solderless terminals.

Easy maintenance rates high. The coils, contacts and overload relays on all Square D starters can be changed in a jiffy... without disturbing external connections. A screwdriver is all you need. And—

"Off-the-Shelf" Parts Kits make normal maintenance and "on-the-job" modifications easier than ever. Packaged parts include interlocks, contacts, coils, overload relays, pushbuttons and selector switches. They're easy to buy, easy to identify and faster to install.



For the complete story, write for Bulletin 8536
Square D Company, 4041 N. Richards St., Milwaukee, 12, Wis.

EC&M HEAVY INDUSTRY ELECTRICAL EQUIPMENT...NOW A PART OF THE SQUARE D LINE

SQUARE D COMPANY

loy was needed which could be heat treated to a room temperature, ultimate strength of 170,000 to 180,000 psi. It had to possess good strength and stability under stress in the heat treated condition to temperatures of 800° F.

In an effort to satisfy this requirement, the Ti-4Al-3Mo-1V composition was developed as a moderate strength, heat treatable alloy for sheet applications. It is now in semicommercial production.

Because Ti-4Al-3Mo-1V is a heat treatable alloy, most of the evaluation was performed on the basis of a study of its solution treating and aging characteristics.

Particular emphasis was placed on solution treating to achieve a minimum yield-to-tensile strength ratio which occurred at a solution temperature near 1550° F.

Solution temperatures of 1600 to 1700° F resulted in bendability that was comparable with that obtained at 1550° F, although the solution treated, tensile ductility decreased above 1600 to 1650° F. Temperatures higher than 1550° F were required to obtain aged, ultimate tensile strengths in excess of 170,000 psi.

Little sacrifice in solution treated tensile strength and bend ductility was observed at a solution temperature as high as 1650° F which resulted in ultimate tensile strengths of 190 000 to 195,000 psi after aging at 900° F for 24 hours. This strength advantage at room temperature (obtained by using a higher solution temperature) also persisted to 1000° F.

Heat treated sheet was stable under stress of 50 000 psi at 800° F for periods to 1000 hours, although the loss in ductility after elevated temperature exposure under stress was somewhat greater in the higher strength condition obtained by solution treating at 1650° F.

No embrittlement was detected. Total creep deformation of material solution treated from 1550° F and aged at 850 to 1000° F was in the range of 1.1 to 1.4 per cent at 800° F after 1000 hours at 50 000 psi.

Material solution treated from 1650° F and aged at 900 to 1000° F showed deformation from about 0.1 to 0.5 per cent; the exposure

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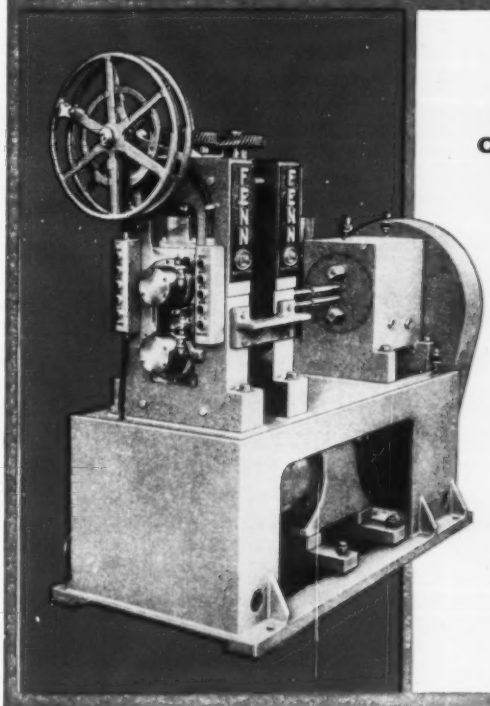
ROLLING MILL



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ROLLING NEWEST
AND TOUGHEST
METALS

MODEL 4-053 is the newest and finest Precision Rolling Mill engineered especially for metallurgical and research laboratories in industry and colleges . . . or for a production mill in many applications. Extremely flexible it can be used as (1) a two-high, (2) a four-high with work rolls driven, and, (3) a four-high with back-up rolls driven. This unique three-way drive, and a full line of accessories, permit a complete range of reductions in both hot and cold rolling. Write for complete specifications or copy of our rolling mill catalog.

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THE FENN MANUFACTURING COMPANY 405 FENN ROAD, NEWINGTON, CONNECTICUT

time was only 300 hours at 800° F and 50,000 psi, so no direct comparison with the 1550° F solution treated material can be made.

Limited formability tests on larger resistance, solution treated pieces of sheet showed that the material bent satisfactorily at room temperature around a radius of 4.0 T and that subsequently it could be stretch wrapped and joggled at room temperature.

A preliminary welding study showed that weld strengths were comparable with those of the base metal, although the as-welded ductility was at a low level. Post-welding annealing appears to offer some promise in improving weld ductility, and good bendability (3.3T) can be obtained in the weld following a solution treatment of 1550° F (½ hour) WQ.

Porosity in the weldment somewhat limits the reliability of test results which, if anything, would indicate that Ti-4Al-3Mo-1V sheet is not readily weldable using present fusion welding techniques.—R. S. Richards, D. L. Day, and H. D. Kessler, Titanium Metals Corp. of America, Henderson, Nev.

Now! Ajax SALT BATH FURNACES with REMOVABLE SUBMERGED ELECTRODES

What used to be a costly, time-consuming job now takes only an hour or two at the most. Labor cost is next to nothing . . . and there is little or no "down time" for the heat treating equipment because Ajax Removable Submerged Electrodes can now be changed without tearing down either the furnace wall or the pot.

Electrodes enter from over the top and slant into the salt bath. *There are no openings below the salt line.* A ceramic tile over each pair of electrodes seals off all air and eliminates corrosion at the salt line. *Thus, all the inherent advantages of submerged design are assured.*

To expose the electrodes for rapid removal, it is only necessary to lift the tile. The entire job can be handled by unskilled labor. Actual electrode changing time is less than an hour per pair.

Write for Bulletin 810 giving full details.

REPLACE AJAX REMOVABLE SUBMERGED ELECTRODES

. . . at absolute minimum labor cost
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AJAX ELECTRIC COMPANY
952 Frankford Ave., Philadelphia 23, Pa.
Associates: Ajax Engineering Corp.; Ajax Electrothermic Corp.

Carburizing Stresses

Distribution of Residual Stresses in Carburized Cases and Their Origin—Carburizing gives an extremely hard, long wearing surface on easily fabricated low carbon and low alloy steels. The combination of surface hardness and high strength and toughness in the core is valuable under certain types of applied stresses.

A valuable byproduct of these case-hardening treatments is the residual compressive stresses in the hardened surface layers. The benefit from these residual compressive stresses in fatigue applications depends on their exact magnitude and depth distribution.

In this work, the residual stress distributions in carburized cases on SAE 8620, 1118, 1018, and 5140 steels were studied using a precision x-ray diffraction technique.

The stress distribution through the case was correlated with the carbon distribution as determined chemically and with the crystalline phase composition.

Some general conclusions may be drawn:

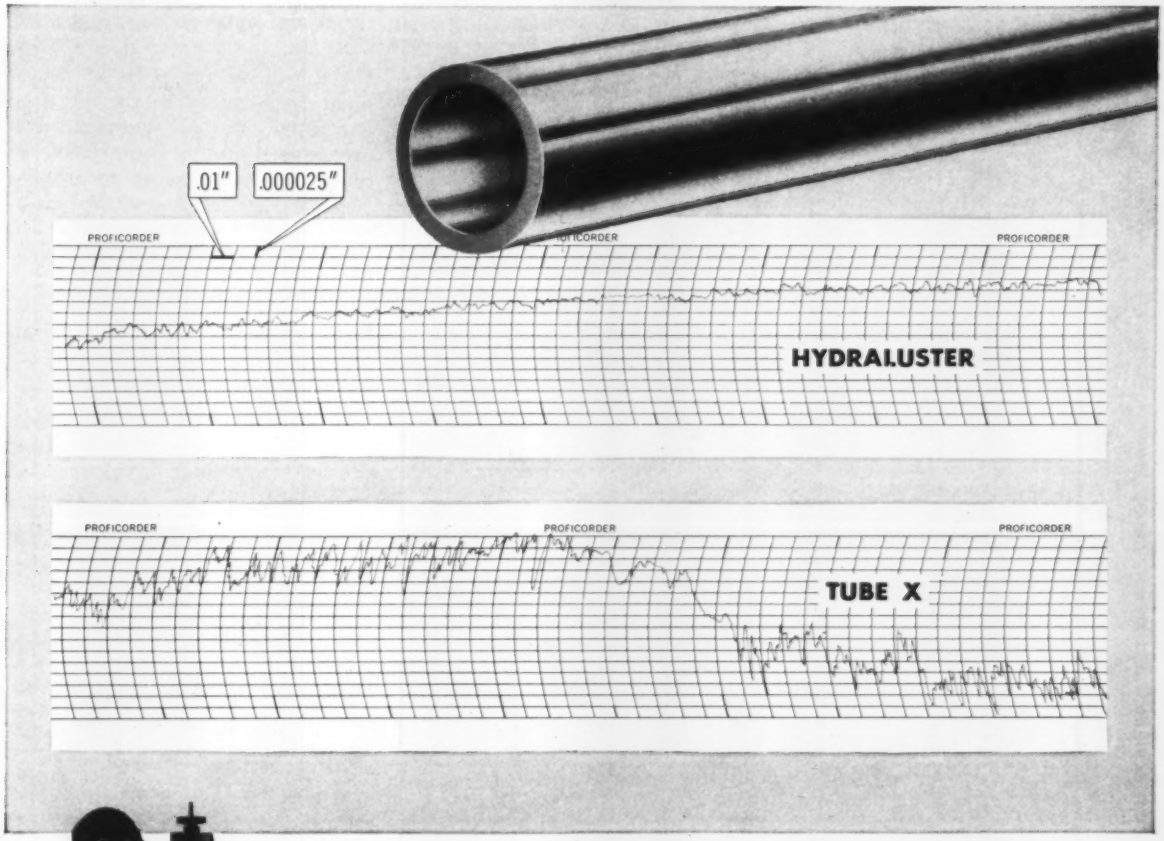
1. The magnitude and distribution of the compressive stress at every depth in a carburized case is determined by the extent of the transformation to martensite and the sequence in which these transformations occur.

2. Maximum compression occurs at 50 to 60 per cent of the total case depth. In low-carbon core samples studied, this corresponds closely to the point at which the carbon content drops below 0.5 per cent.

3. The reversal in the sign of the residual stress from compression in the case to tension in the core occurs at or near the case-core boundary.

4. Proceeding outward through the case from the case-core boundary to the point of maximum compression, the stress becomes more compressive due to sequence of the transformations to isothermal transformation products or to martensite.

5. Proceeding outward through



VERIFICATION: Measurements of Hydraluster and Tube X were made on The Proficorder—an instrument of our manufacture for accurately showing the true profile of practically any machined or finished surface. The tests were conducted in our laboratories under my personal supervision. And I verify that both tubes were measured under identical conditions. The resulting graphs show the exact differences in the samples furnished. **Douglas Palmer — Chief Inspector, Micrometrical Mfg. Co., Ann Arbor, Mich.**

In micro-inch comparison of hydraulic tubing . . .

HYDRALUSTER shows smoothest, most friction-free I.D.

These graphic red lines are recorded measurements showing a surface profile *inside* both HYDRALUSTER and a length of standard hydraulic tubing. *Both tubes were selected at random from warehouse stocks*, then accurately measured in microinches by the sensitive stylus of the famous PROFICORDER.

Hydraulic system efficiency and dependability, in a large degree, depend on factors illustrated by the red lines. Tube X is *not* a scrap piece of tubing. In fact, it represents a quality grade purchased and used every day. Which tube would you select to offer the least resistance to hydraulic flow . . . to transmit fluid with the least amount of pressure drop . . . and to create the least fluid turbulence?

Hydraluster is the answer, of course. And Hydraluster is the right tube to specify when you want to insure these same performance characteristics in your hydraulic systems.

SAMPLES AND SPECIFICATIONS: Examine Hydraluster finish yourself. Your name on company letterhead will bring specifications and a sample by return mail. *Hydraluster is sold at standard carbon hydraulic tubing prices.*

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PITTSBURGH 30, PA. DEPT. NO. 1-E

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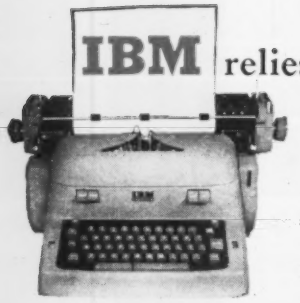
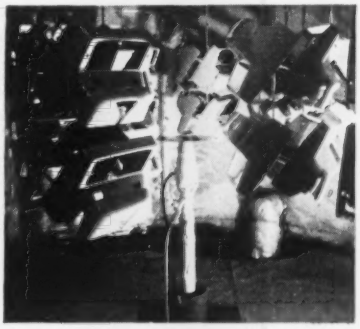


IBM relies on **RANSBURG NO. 2 PROCESS Electrostatic Spray Painting** to get the excellent and uniform high quality wrinkle finish on all

IBM ELECTRIC TYPEWRITERS



Both prime and finish coats are uniformly applied to IBM Electric Typewriter cases as they rotate around the floor-mounted Ransburg No. 2 Process reciprocating disks. Automatic Electro-Spray provides three times as many pieces per gallon as by former hand spray.

IBM's strict quality standards are easily maintained with Ransburg No. 2 Process in the painting of Electric Typewriter parts. Rejects by the former hand spray method used to run as high as 30% on some parts. Now, with automatic Electro-Spray, rejects for all reasons are only 3% to 5%.

Three Times as Many Pieces per Gallon!

Along with increased production, paint mileage is stepped up, and they get three times as many pieces per gallon as by the former hand spray method. That's because efficiency of the Ransburg No. 2 Process Reciprocating Disk puts the paint where it's supposed to go . . . on the parts.

Want to know how Ransburg Electro-Spray can improve the quality of your painted products . . . and at the same time, cut your paint and labor costs? At no obligation to you, we will make complete laboratory tests with your products to prove the advantages and cost saving benefits which can be yours with Ransburg No. 2 Process. Write or call.

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the case from the point of maximum compression to the surface, the magnitude of the compressive stress decreases as the amount of martensite is restricted by incomplete transformation of the austenite.

6. On some carburized specimens, thin surface films may occur in which there are wide variations in phase compositions and correspondingly wide variations in residual stress.—D. P. Koistinen, General Motors Corp., Detroit.

Endurance Limit

Effect of Per Cent Tempered Martensite on Endurance Limit—The effect of microstructure on the endurance limit of the following steels was investigated: SAE 1340, 4042, 4340, 5140, and 80B40. By using different quenching media and by changing the cross section of the quenched bars, various amounts of martensite were produced by continuous cooling.

A relationship exists between the percentage of martensite formed on quenching and tempering to 36 Rockwell C and the endurance limit. A small percentage of nonmartensitic structure has an adverse effect on the fatigue strength of the steels tested. Below 85 per cent martensite, the endurance limit is affected little by microstructure.

In the application of hardenability to design, some specifications require 90 per cent martensite at the ¾ radius. In less stringent specifications, 80 per cent martensite is required and in still less, 50 per cent martensite is required.

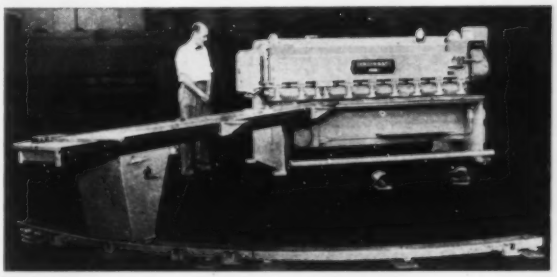
Provided that 100 per cent martensite is obtained at and just below the surface, there appears to be little difference between the 50 per cent and 80 per cent martensite requirement at the ¾ radius. The 90 per cent martensite would give a higher endurance value at this point.

If the surface is less than 100 per cent martensite, the endurance limit drops off rather sharply to the 90 per cent value and less sharply to the 85 per cent value.—F. Borik, R. D. Chapman, and W. E. Jominy, Chrysler Corp., Detroit.

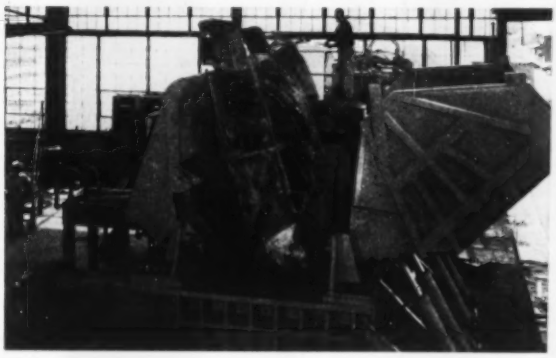
Shear Cuts Angles Within a Tolerance of 2 Minutes

The angular shearing gage with this 10 Series by 8 ft shear accurately gages the length of the sheared pieces. All gage stops are equipped with micrometer adjustments. Accuracy is insured by hydraulic hold-downs which clamp with 5 tons of pressure.

The shear operates at 65 strokes a minute. The carriage moves easily between angular gaging positions. Pivot point for the shearing gage is in the shear table. *Write*: Cincinnati Shaper Co., Hopple, Garrard, and Elam Streets, Cincinnati 25, Ohio. *Phone*: Kirby 1-5010



Baling Press Handles Car Bodies in 2½ Minutes



The Dempster-Balester 2000 does a prebaling operation between its auxiliary compression door and a skip pan loader. This reduces the dimensions of a car body so that it can be placed easily into the medium-size charging box (48 in. deep, 72 in. wide, and 144 in. long).

Prebaling takes less than 1 minute; the automatic baling cycle is completed in 90 seconds.

Bales are about 24 x 24 x 48 in. They weigh from 1500 to 2000 lb.

Press features: Pushbutton controls, automatic compression, and return of main rams. *Write*: Dept. S-B, Dempster Bros. Inc., Knoxville 17, Tenn. *Phone*: 4-1671

Gear Checker Inspects Spur or Helical Gears for Concentricity

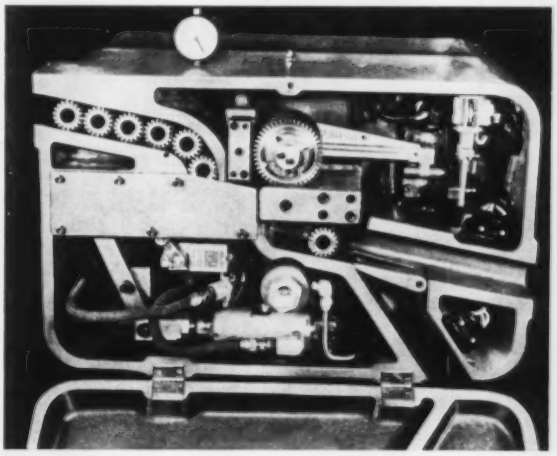
This automatic gear monitoring unit can inspect a gear every 6 seconds.

The amount of eccentricity in the gear is determined by using conjugate rolling action in two directions of rotation with a master gear in mesh with the part.

After checking, parts within predetermined tolerances are passed automatically to the next operation; parts that are eccentric are shunted from the system.

The accuracy adjustment is infinitely sensitive to eccentricity errors.

The unit is designed for use in automated production lines. One central panel can electrically operate allied automation units. The gear checker comes in a range of sizes. *Write*: Michigan Tool Co., 7171 E. McNichols Rd., Detroit 12, Mich. *Phone*: Twinbrook 1-3111

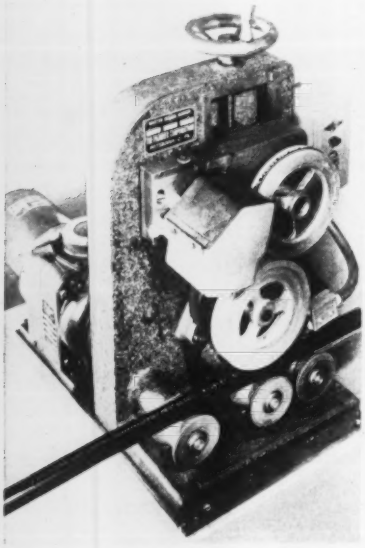


NEW PRODUCTS and equipment

Offset Tube Printer

Material from ⅛ to 4 in. OD can be handled by this wire, bar, and tube printer without changing guide wheels.

The unit will print a continuous message, set on a 24-in. offset printing wheel, in type sizes from 1/16 to 1 in.

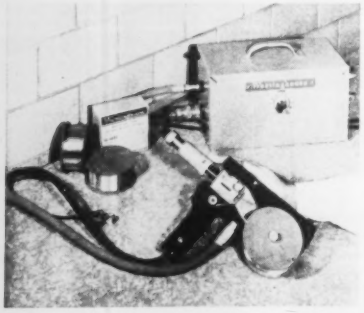


A ½-hp motor drives the material through the marking head at speeds of 45 to 450 lineal feet a minute. *Write*: Pannier Corp., 220 Sandusky St., Pittsburgh 12, Pa. *Phone*: Fairfax 1-5185

Aluminum Welder

This portable inert gas welder has an integrally mounted wire drive (motor driven) and a wire supply.

There are two models. One handles filler wire 1/50 to 3/64 in. in diameter; the other is for wire from 3/64 to 1/16 in. in diameter.



Travel speeds for horizontal fillets average 22 ipm with 1/16 in. filler wire.

Gas and welding current are delivered to the gun by a hose assembly in which argon flows around the central conductor.

The gun weighs less than 4 lb when loaded with 1 lb of filler wire. *Write*: Westinghouse Electric Corp., Box 2278, Pittsburgh, Pa. *Phone*: Express 1-2800

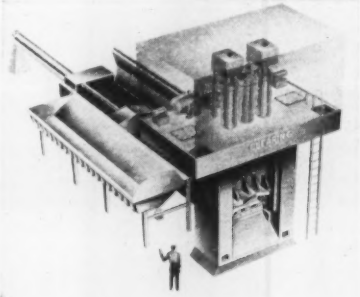
Shell Parting

LF-460 is a silicone parting emulsion used with the shell molding process. The emulsion, dimethyl silicone oil, is shipped in a concentration of 35 per cent. Diluting it with tap water and stirring ready it for use.

The parting has low film buildup. This practically eliminates sludge formation on the pattern. *Write*: Silicones Div., Union Carbide Corp., 30 E. 42nd St., New York 17, N. Y. *Phone*: Murray Hill 7-8000

Scrap Shear

The Hydra-Shear develops 600 tons of pressure and can cut up to 30 tons of scrap an hour. Its shear blades are easily adjusted to compensate for wear and will cut all types of scrap steel to meet specifications of mills and foundries.



The feed hopper (22 ft x 6 ft x 1 ft 10 in.) is loaded with scrap and tilted by hydraulic cylinders to dump the scrap into a charging box.

A hydraulic ram operating through the charging box pushes the scrap into the shear position. The stroke of the charging ram is adjustable in 6-in. increments from 6 to 48 in. Scrap can be cut into desired uniform lengths.

While scrap is being fed into the shear, the hopper is reloaded. *Write*: Consolidated Mill Supply Co., 5843 S. Loomis Blvd., Chicago 36, Ill. *Phone*: Walbrook 5-5000

Combustion Control

Series 20 Unimix machines (manual or automatic) deliver air-gas mixtures for 800,000 to 2,350,000 Btu maximum burner input and 215,000 to 500,000 Btu minimum burner input.

Up to nine gas orifices in the manifold are uncovered, one at a time, as the air valve moves from closed to open position. Individual openings are adjusted manually and are predetermined according to the type mixture desired.

Air and gas are drawn in by the blower. *Write*: Industrial Combustion Div., Eclipse Fuel Engineering Co., Rockford, Ill. *Phone*: 8-3751

Hot Sinter Screen

This screen can handle 132 tons an hour of hot sinter at about 1400° F with hot spots up to 2400° F. It operates at 800 rpm with a ⅜-in. amplitude.

The screen is used in a sintering operation which agglomerates fine ore into the larger size particles needed for blast furnaces.

Heat and wear resistant grate sections of the screen are made of high chrome iron. These sections are bolted to seven pallet assemblies with stainless steel bolts. The self-supporting pallet assemblies are made of tubular cross members (316 stainless) welded to stainless steel angles for bolting to the screen body.

Side plates and the back plate of the screen body are made of

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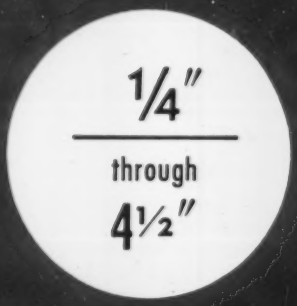
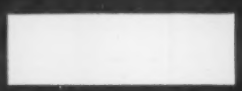


rounds

hexes



bar flats on application

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STEEL CORPORATION

STAINLESS STEEL DIVISION

Box 4606 • Detroit 34, Michigan

FORMERLY ROTARY ELECTRIC STEEL CO.

T-1 steel. The back plate has stainless steel plates to deflect radiant heat from the fines and to provide for air circulation between the back plate and the deflector plates. *Write*: Allis - Chalmers Mfg. Co., Milwaukee 1, Wis. *Phone*: Spring 4-3600

High Lifts

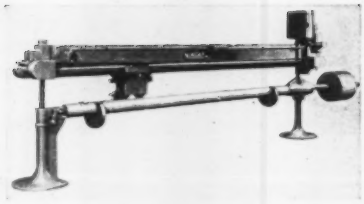
The Triplex Mast provides maximum fork heights of 108, 144, 180, 198, and 210 in. Three nested, I-beam lifting members are raised hydraulically by a multistage cylinder.

Only two single lift chains are needed to operate the cylinder. The rest of the space between the cylinder and uprights is left open to give the operator a view of the load being handled. The chains work on a single pair of sheaves to transmit lifting power to the mast. *Write*: Materials Handling Div., Yale & Towne Mfg. Co., 11000 Roosevelt Blvd., Philadelphia 15, Pa. *Phone*: Orchard 3-1200

Power Groover

Single and Pittsburgh lock seams are made by eight models of the Giant Power Groover. Mild steel up to 16 gage can be handled. Working lengths range from 4 to 10 ft.

Power is supplied by a reversible gearhead motor with a built-in



brake to stop the carriage quickly for a rapid return stroke. The carriage is returned to the starting position automatically. *Write*: Niagara Machine & Tool Works, 683 Northland Ave., Buffalo 11, N. Y. *Phone*: Taylor 4070

Furniture Tube

The No-Buff aluminum tube is made in rectangular, oval, and square forms. There are two grades: High strength, which can be easily punched, drilled, dimpled, or formed; and all-purpose, which is readily flattened and formed and is hard enough to be used with riveting and other fastening methods.

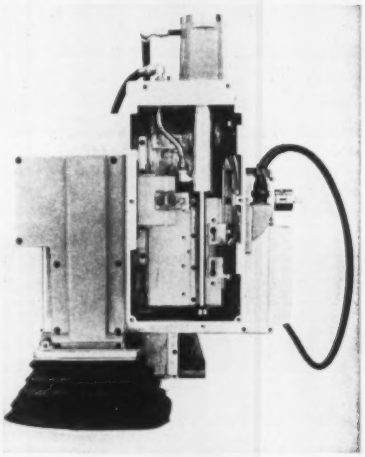
Both types are individually wrapped in protective paper. A wide range of wall thicknesses and diameters is available. *Write*: Harvey Aluminum Sales Inc., 19200 S. Western Ave., Torrance, Calif. *Phone*: Nevada 6-2111

Wheel Dresser

Model 89 is a contour wheel dresser used with cylindrical grinders. It will dress any angle on the wheel, perpendicular or horizontal.

The dresser can undercut grinding wheels and dress at uniform peripheral speed.

Computed templates for profile



widths up to 6 in. and depths to 3½ in. are available with the unit. It uses an inclined plane cam reduction mechanism. *Write*: Hoglund Engineering & Mfg. Co. Inc., 343 Snyder Ave., Berkeley Heights, N. J. *Phone*: Crestview 3-7183

Power Strapper

Model PSF-1 feeds steel strapping vertically around packages, skids, crates, or bundles. Strapping can be fed at a rate up to 240 ft a minute.

When used with power operated strapping tools, it applies up to 200 straps an hour.

The feeder can be mounted on a conveyor or set up as a separate strapping station. It handles strapping from 5/16 in. wide by 0.012 in. thick to ¾ in. wide by 0.035 in. thick.

Excess strapping is fed back to the coil to prevent waste. *Write*: Signode Steel Strapping Co., 2600 N. Western Ave., Chicago 47, Ill. *Phone*: Armitage 6-8500

Boring Machine

The LeBlond-Carlstedt Rapid Borer does solid boring, trepanning, and counterboring of long holes. The borer has capacity for holes 5/16 to 4¼ in. in diameter.

The machine is suited to work that is symmetrical—round, square, octagonal, tapered, or stepped. It uses a tool which cuts at high speed with excellent accuracy and finish.

Cutting oil is forced between the boring bar and the hole wall, forming a continuous bearing. It flushes back through a hole in the boring head and bar, carrying away the chips.

The chip form is controlled by

Automobile trim of

Superior Stainless STRIP STEEL

You can't tell the age of a car by its stainless steel! After a thousand or *two hundred thousand miles* of driving, Superior Stainless gleams good as new. ● Enjoy the beauty of stainless on the cars *you* buy —costs you nothing in care, gives you everything in pride and pleasure!

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How to make a Beeline

to a honey of a Plant Site

(a suggestion to men in industry)

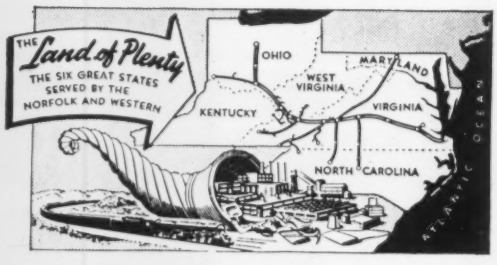
Varied raw materials
Nearness to markets
Excellent power at low rates
Productive manpower
Dependable N&W transportation
Adequate water
Nearness to the Port of Norfolk
Excellent climate
Fair tax structures
Clean communities
Industry-conscious public
Good real estate values
Nearness to Bituminous Coal

The first step in making a beeline to a good industrial location is to know where the site is. If you don't have this information to your satisfaction, let the Norfolk and Western help you.

N&W plant location specialists have complete, up-to-date files on numerous excellent sites for *any* plant — regardless of size. They understand the problems of manufacture and distribution with respect to location. There is no obligation, and if you're seeking a good site they will go to work for and with you *quietly* and *promptly*. What they show you may be the way to make a beeline to a honey of a plant site.

Write, wire or call:

L. E. Ward, Jr., Manager
Industrial and Agricultural Department
Drawer S-779 (Phone Diamond 4-1451, Ext. 474)
Norfolk and Western Railway
Roanoke, Virginia



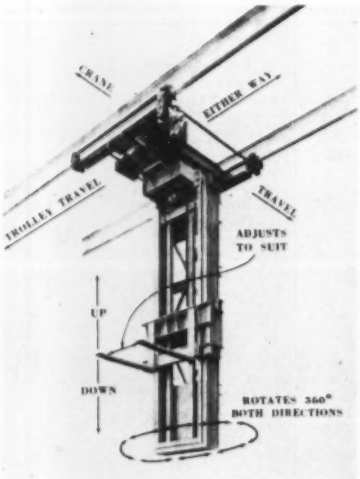
Norfolk and Western RAILWAY

NEW PRODUCTS and equipment

the tool angles and the feed and speed combination to keep the tool faces clean and the chip passage clear. *Write*: R. K. LeBlond Machine Tool Co., Cincinnati 8, Ohio. *Phone*: Jefferson 1-0910

Fork Lift Rides Overhead

A flexible control cable makes it possible to operate this fork lift at a safe distance from the load. There is no danger from unbalanced loads because they are suspended from above.



The fork lifts can be supplied with motions motorized or manually operated, in any combination. Various capacities and lifts are available. *Write*: Cleveland Tramrail Div., Cleveland Crane & Engineering Co., Wickliffe, Ohio. *Phone*: Whitney 3-3700

Belt Grinder

Model FF-6 Flat Finisher does wet abrasive belt grinding, polishing, and deburring of flat work (sheets, strip, bars, stampings, plates, etc.) up to 6 in. wide and 6 in. high.

An electromagnetic platen is

an ounce of prevention!

It pays to periodically check the "health" of your blast-cleaning operation to prevent costs from creeping up. You may not be doing as well as say, a year ago. A check on abrasive prices (some have increased more than others), on abrasive consumption, on tonnage cleaned and on cost of replacement parts, will tell.

Such a check is easy to make using simple forms we supply. A sample set will be sent you on request.

One thing sure — if your operation is "ailing," Malleabrasive will cure, as it has in hundreds of other plants.

Competent service personnel available without obligation.

Sold by Pangborn Corporation, and by leading distributors of foundry supplies from coast to coast.

MALLEABRASIVE

THE GLOBE STEEL ABRASIVE CO., MANSFIELD, OHIO ®

1907—Fiftieth Anniversary—1957

40 pages
140 illustrations

Write for your copy of this new catalog

Chances are you will find a material handling situation similar to your own, illustrated and described in this new book!

The 140 actual installation photos in the Logan catalog show where and how to use the principal types of conveyors to best advantage in meeting individual plant conditions. Both standard and special applications are shown, making this book a valuable and informative reference, whether or not you contemplate using additional conveyors at this time.

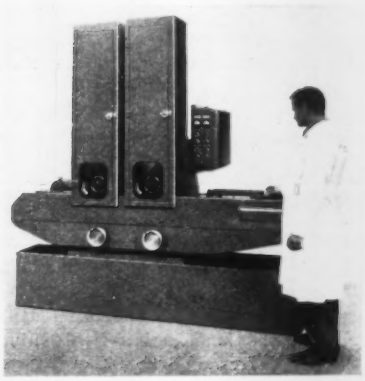
Tell her to write for the new Logan book today

Write today. Perhaps you will discover here that handling solution you have been looking for. There is no obligation in requesting your copy.

LOGAN CO., 535 CABEL ST.
Louisville 6, Ky.

Logan Conveyors

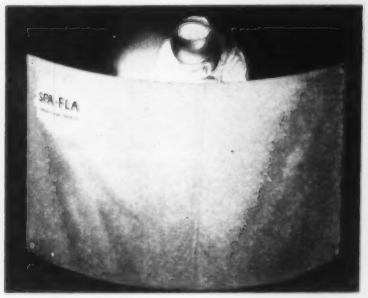
NEW PRODUCTS and equipment



used to hold material on the conveyor belt. The magnetic force can be varied to suit the size or mass of the work. *Write*: Hammond Machinery Builders Inc., 1611 Douglas Ave., Kalamazoo, Mich. *Phone*: Fireside 5-7151

Welding Shields

These portable shields are self-supporting, but can be rolled up easily and carried to the next job. They are made of a flameproof canvas over a wire mesh frame.



The shields are made in a wide range of sizes. Industrial Products Co., 2833 N. Fourth St., Philadelphia 33, Pa. *Phone*: Nebraska 4-2522

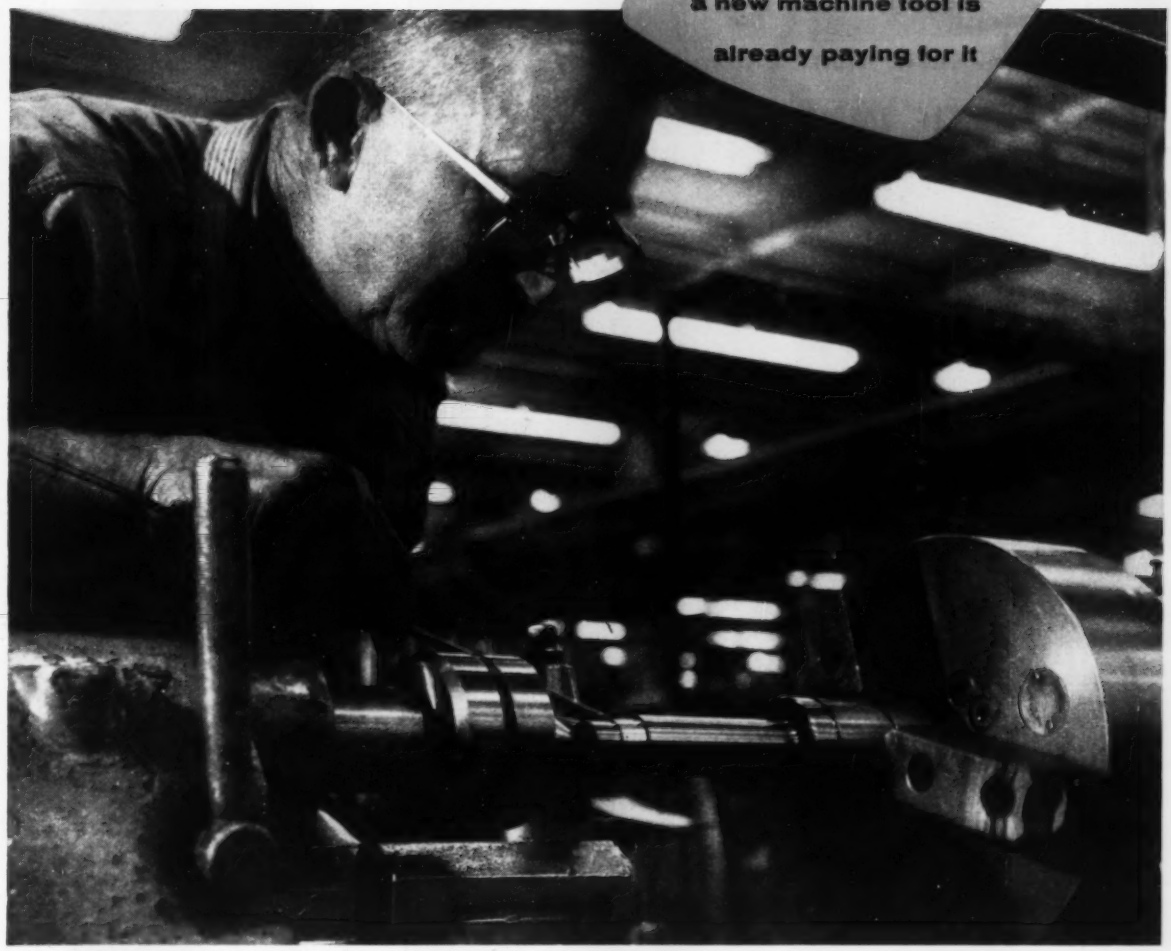
Muffle Furnace

Temperatures up to 2600° F are reached with this furnace. Its power input is controlled by a 48 step, tap changing transformer. Chamber temperatures are indicated by a pyrometer at all times.

Added insulation is placed above, below, and on the sides of the heating chamber where it is most needed. Silicon rod heating ele-

JONES & LAMSON
MACHINE COMPANY

the man who needs
a new machine tool is
already paying for it



Still useful, yes . . . but is it still Profitable?

When the purchase of new machine tools comes up for discussion, it's not at all unusual for someone to comment — "but our present machines still seem to be doing a good job".

On the surface, this objection seems to make good sense. It doesn't stand up, however, because it isn't good economics.

While surveying a number of metalworking plants recently, a prominent industrial publisher discovered this startling fact: — *In every plant with machinery more than ten years old, profit margins were steadily falling!*

Why should this be the case, especially when sales were at an all-time high?

The answer, of course, is that older, still "useful" machines cannot produce enough goods at a low enough cost to compete favorably with new machines on a profit basis.

Write for J & L's Replacement Information Kit, which contains much valuable information. Jones & Lamson Machine Company, 517 Clinton St., Springfield, Vermont.

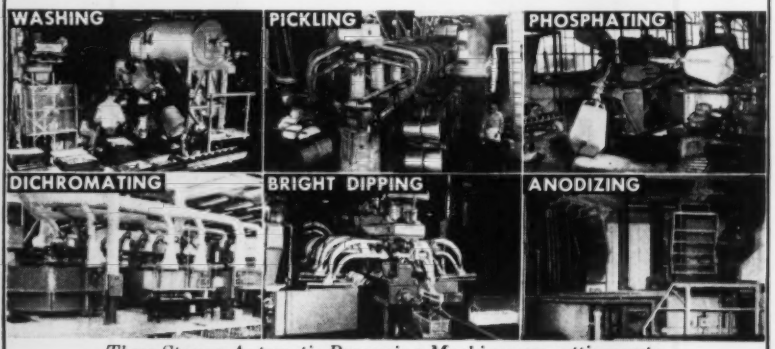
Turret Lathes • Fay Automatic Lathes • Precision Boring Machines • Thread & Form Grinders • Optical Comparators • Threading Dies, Taps & Chasers

THE FINISHING TOUCH

A. B. HOEFER, *Vice-President*, FREDERIC B. STEVENS, INC.

AUTOMATIC IMMERSION PROCESSING RESULTS IN REAL SAVINGS!

MORE AND MORE, PROCESS ENGINEERS are recognizing the money savings to be realized from automatic processing installations, i.e. *Anodizing and other aluminum immersion treatments; Blackening; Bright Dipping; Dichromating; Cleaning; Pickling; Washing; Phosphating* for rust prevention; wear resistance, and prior to cold drawing; *Stripping* as well as *Electroplating.*



These Stevens Automatic Processing Machines are cutting costs.

"PROFIT-MAKING MACHINES" was one term recently used by a Stevens Automatic Machine user. Money saved in labor, floor space, production control and similar costs, if tacked on the other end, could very easily be termed "profit."

IN ANALYZING AUTOMATIC MACHINE USERS at Stevens for the past three years we were interested in the increased number of processing applications which manufacturers are adapting to this versatile equipment.

AUTOMATION HAS INFLUENCED THESE INCREASES, for our automatic machines fit ideally into "straight line" production layouts and eliminate handling and human error so costly in today's modern manufacturing techniques. All of our machines can be equipped with automatic load and unload features and have flexibility which enables them to be used for a variety of metal treatments.

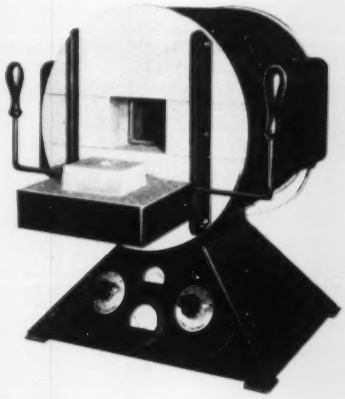
IF YOU ARE A PROCESS ENGINEER, or occupy a similar post of responsibility in your plant, contact your Stevens sales engineer or write for more information on automatic immersion processing as well as electroplating. Let us show you how you can recommend methods to save your company money. Write: Frederic B. Stevens, Inc., 1800 Eighteenth Street, Detroit 16, Michigan.

FREDERIC B. STEVENS INCORPORATED
YOUR METAL FINISHING SUPERMARKET
DETROIT 16, MICHIGAN

STEVENS 75 YEARS OF SERVICE

WAREHOUSES AND OFFICES IN PRINCIPAL CITIES

NEW PRODUCTS and equipment



ments are arranged to achieve temperature uniformity in the heating chamber. Inside dimensions of the chamber are 7 x 4⅛ x 2¾ in. *Write*: Hevi-Duty Electric Co., Milwaukee 1, Wis. *Phone*: West 3-2756

Casting Counters

Parts weighing from ½ to 25 lb are counted by these machines. They cannot double count.

Parts up to 10 in. high and 15 in. wide can be counted. Models for small castings have a selector switch for counting two to five pieces at a time. *Write*: Hartley Controls Corp., Neenah, Wis.

Cutoff Machine

Lengths of parts are held within 0.010 in. by this automatic machine for nonferrous tubing.

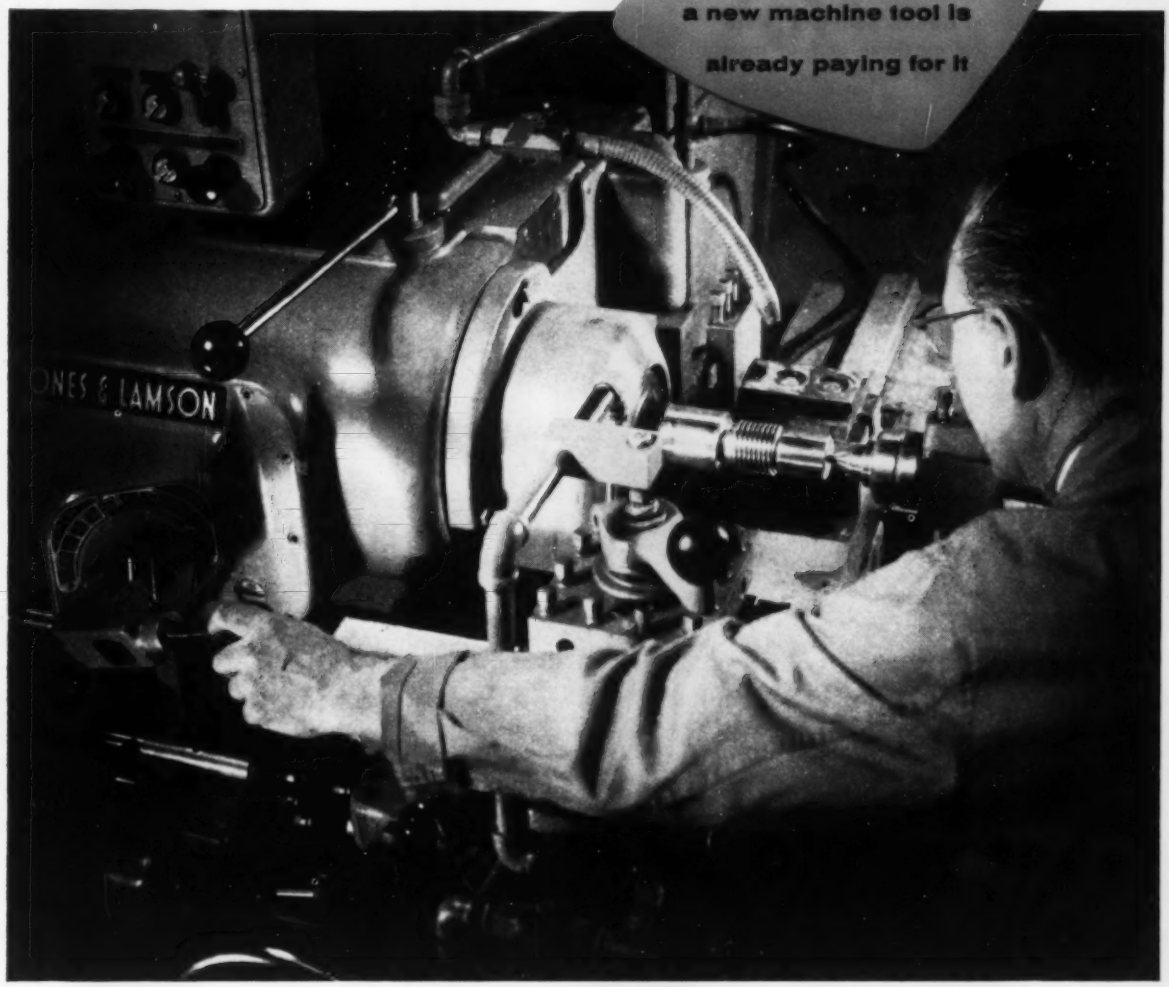
Clamping the tubing on each side of the cut prevents the formation of hanging burrs at the breakthrough point.

The saw is fed by a hydraulic cylinder in a straight line. This avoids gyroscopic forces that would act on the saw blade if it were swung in an arc.

Attachments make it possible for the machine to straighten, temper, and round-form tubing

JONES & LAMSON MACHINE TOOLS

the man who needs a new machine tool is already paying for it



The Turret Lathe with a fully automatic thread-chasing cycle!

Here is full turret lathe versatility and a threading attachment with a fully automatic cycle — all in one machine. Now you can be sure of concentricity of threading with other lathe work, *all done in one chucking*, with the time saving of the Auto-Threader!

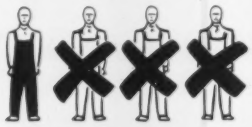
This Auto-Threader will chase straight or taper threads — or a combination — internal or external, from the front of the machine.

Other features include: uniform thread length, by means of positive stop and follower nut disengagement together with rapid tool withdrawal; precision lead control by full depth follower nut engagement on a hardened and ground leader.

Write for descriptive folder No. 5440. Jones & Lamson Machine Company, 517 Clinton Street, Springfield, Vermont.

Turret Lathes • Fay Automatic Lathes • Precision Boring Machines • Thread & Form Grinders • Optical Comparators • Threading Dies, Taps & Chasers

SILENT HOIST LIFTRUK

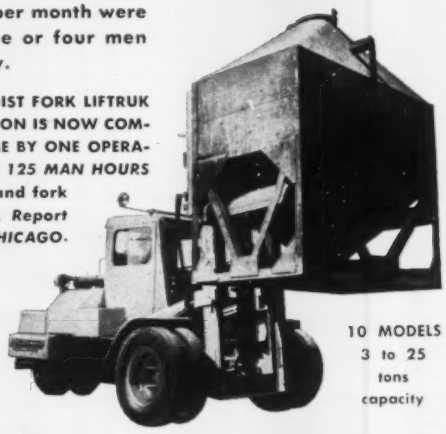


INLAND STEEL IS SAVING approx. 125 MAN HOURS EACH MONTH on JUST ONE SPECIFIC REQUIREMENT

"Four to six cars of carbide per month were formerly unloaded by three or four men working eight hours per day.

"THROUGH THE USE OF SILENT HOIST FORK LIFTRUK Model FK 7½, THIS SAME OPERATION IS NOW COMPLETED IN A PORTION OF THE TIME BY ONE OPERATOR . . . *SAVING APPROXIMATELY 125 MAN HOURS PER MONTH*" . . . releasing men and fork truck for other useful purposes. *Report from INLAND STEEL CO. EAST CHICAGO.*

SILENT HOIST LIFTRUK is a real work horse — operates long periods without maintenance — on muddy or irregular terrain. STANDARD EQUIPMENT includes Fluid Drive, Power Steering, High Undercarriage, extra large torque multiplier for traction.



10 MODELS 3 to 25 tons capacity

Ask for Bulletin No. 77.

SILENT HOIST & CRANE CO.
Pioneer Mfrs. of Heavy Duty Materials-Handling Equipment
849 63rd Street, Brooklyn 20, N. Y.

ARMSTRONG WRENCHES

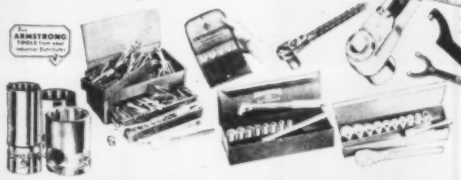
TYPES and SIZES for Every Industrial Use!

ARMSTRONG Wrenches have engineered designs, a wide safety factor of extra strength, accurately machined openings that go over screw heads or nuts easily, grip firmly—will not slip, round corners or mar faces.

Drop forged from special high tensile carbon and alloy steels, heat treated to an exactly predetermined balance of hardness, toughness and tensile strength. ARMSTRONG Wrenches will not "chew out," will stand up through years of service, making work faster, easier and safer.

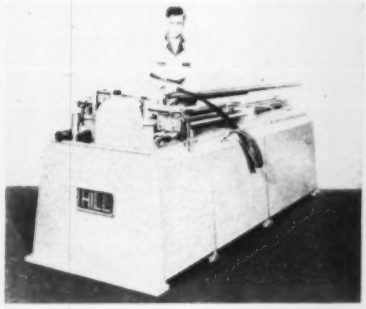
In sizes and types, ARMSTRONG Wrenches comprise the most complete line of industrial wrenches manufactured. Specify "ARMSTRONG" when ordering wrenches.

Write for Catalog



ARMSTRONG BROS. TOOL CO.
5279 W. ARMSTRONG AVE. CHICAGO 30, ILLINOIS

NEW PRODUCTS and equipment

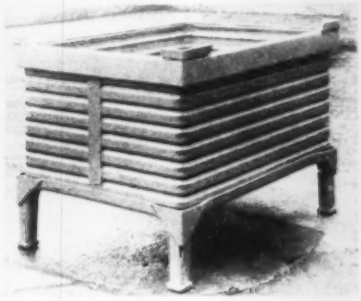


from coiled stock. *Write*: Walter P. Hill Inc., 22183 Telegraph Rd., Detroit 19, Mich. *Phone*: Kenwood 4-9190

Box for Hot Materials

This steel box is made of a low alloy, high tensile steel to provide the strength needed in handling hot work such as castings, forgings, and special parts after annealing.

The box is 38 x 53 x 26 in. and made of 7 gage steel. One box can be stacked on top of another.



The box stands 16 in. from the ground to provide clearance for handling by fork lift trucks. *Write*: Pressed Steel Div., Republic Steel Corp., 6100 Truscon Ave., Cleveland 27, Ohio. *Phone*: Michigan 1-0810

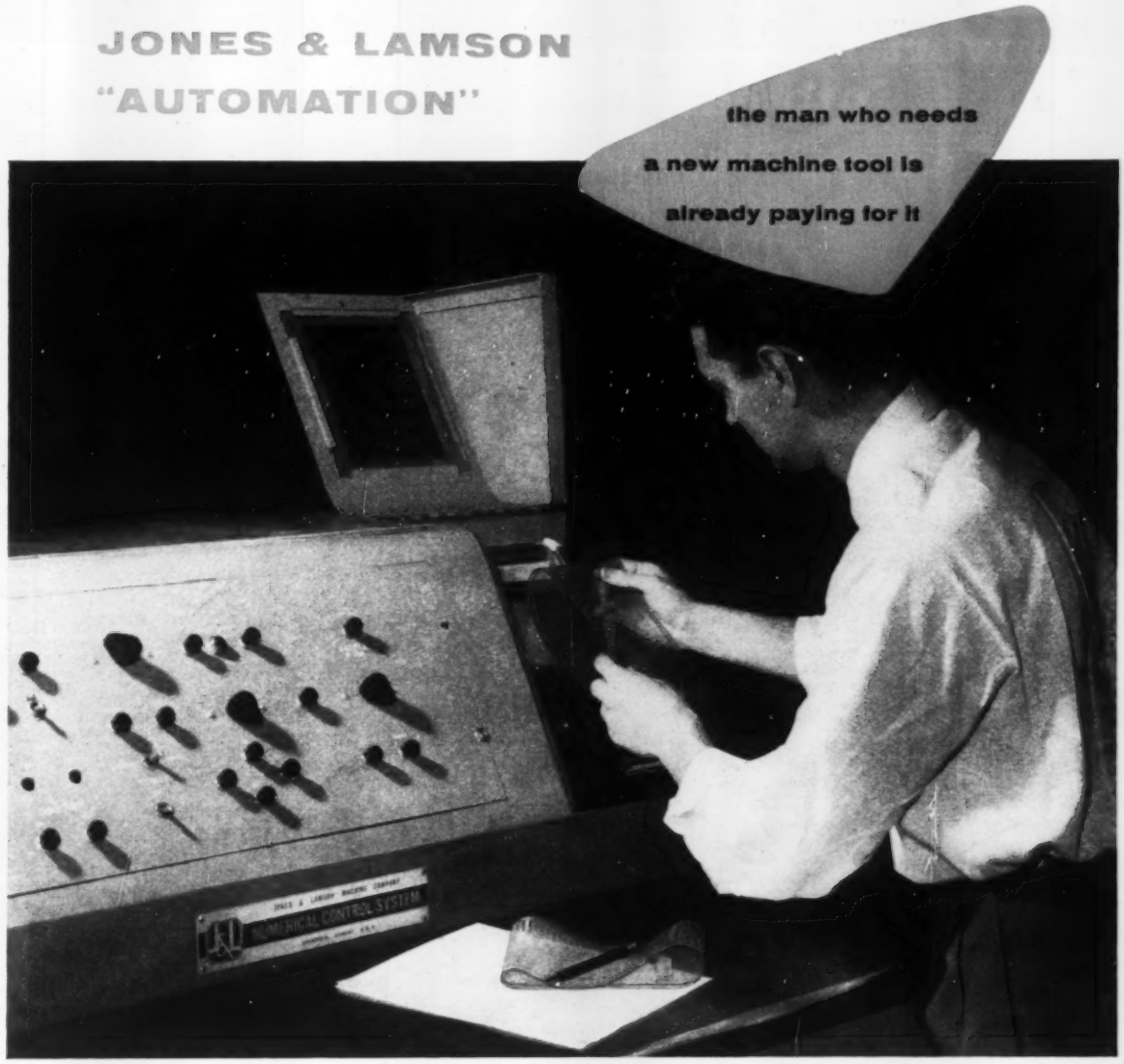
Slot Deburrer

Model BMI-15M will deburr and chamfer slots around the periphery of a part. The machining cycle is automatic.

Form tools, reciprocating at 2½ strokes a second, straddle cut each slot. Each tool chamfers (and deburrs) one side and half of the bottom of each slot.

Cutting cycle per slot is 3 seconds. Sharp edges on the outer

JONES & LAMSON "AUTOMATION"



J&L's Unique Approach to "Automation"

"Automation" is a tricky word — one that has many definitions. However, at Jones & Lamson its basic meaning is always the same . . . "the solution to a cost reduction problem".

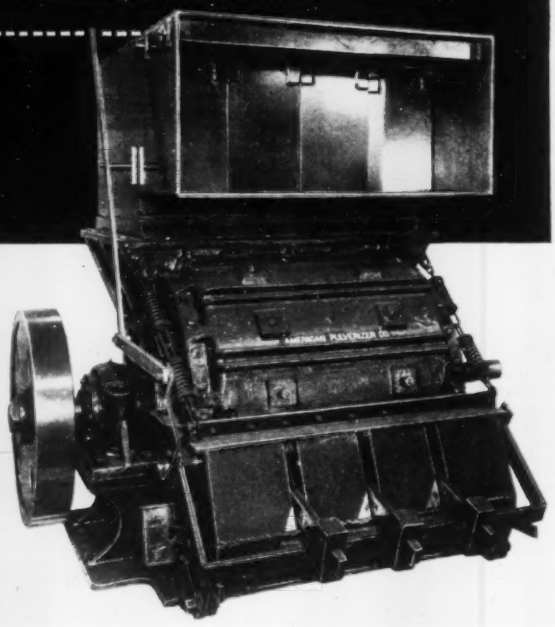
In some cases, this could involve automatic in-process gaging, size adjustment feed back, self-resetting of tools, and automatic handling for long runs on single machines. Other problems might call for an articulated, sequential *line* of machines, complete with automatic handling, inter-machine transfer and automatic control of speeds, feeds, etc.

Through numerical control, using punched tapes, J&L "automation" *also greatly increases small-lot flexibility*. In this case, machine set-up and change-over become primarily an office procedure.

We would be pleased to show you how J&L's approach to "Automation" can be put to good use in *your* operations. Write for literature — Jones & Lamson Machine Company, 517 Clinton St., Springfield, Vermont.

Turret Lathes • Fay Automatic Lathes • Precision Boring Machines • Thread & Form Grinders • Optical Comparators • Threading Dies, Taps & Chasers

convert metal turnings into cash

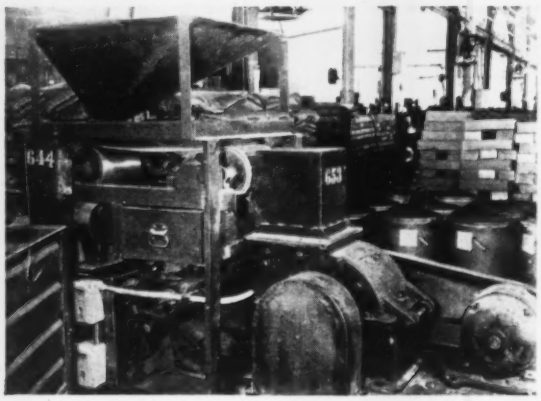


Long, curly, troublesome metal turnings, reduced in an American Metal Turnings Crusher, can produce additional profits for your plant.

Reduced to chip form, metal turnings bring $2 to $5 more per ton. Handling metal chips by shovel or pneumatic systems is easier, too, and chips require **75% less storage** space than bulky machine turnings. You'll recover more cutting oil from chips . . . up to 50 gallons per ton! More important, American Metal Turnings Crushers pay for themselves and produce substantial profits for years to come. Models available with capacities ranging from 1 to 50 tons per hour. To get all the details, write American today.

reclaim fused welding flux

One industrial plant saved more than $10,000 a year by using an American Welding Flux Crusher to regranulate fused welding flux. Write American for details.

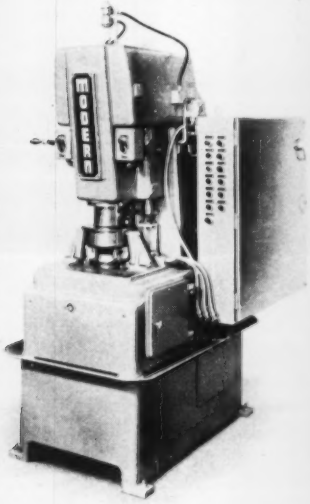


American PULVERIZER COMPANY

ORIGINATORS AND MANUFACTURERS OF RING CRUSHERS AND PULVERIZERS

1539 MACKLIND SAINT LOUIS 10, MISSOURI

NEW PRODUCTS and equipment



face of the slot are eliminated by a patented cutting action that generates the critical-depth chamfer uniformly within dimension. *Write*: Modern Industrial Engineering Co., 14230 Birwood Ave., Detroit 38, Mich. *Phone*: Webster 3-7280

Zinc Brighter

Rohco 503 is a balanced liquid formulation for still and automatic plating. It resists breakdown at high temperature, and usually lasts for 50,000 or more ampere-hours per gallon.

The brightener has a fine grain for maximum luster, corrosion resistance, and acceptance of chromate conversion coatings or black finishes. *Write*: R. O. Hull & Co. Inc., 1300 Parsons Court, Rocky River 16, Ohio. *Phone*: Edison 1-5100

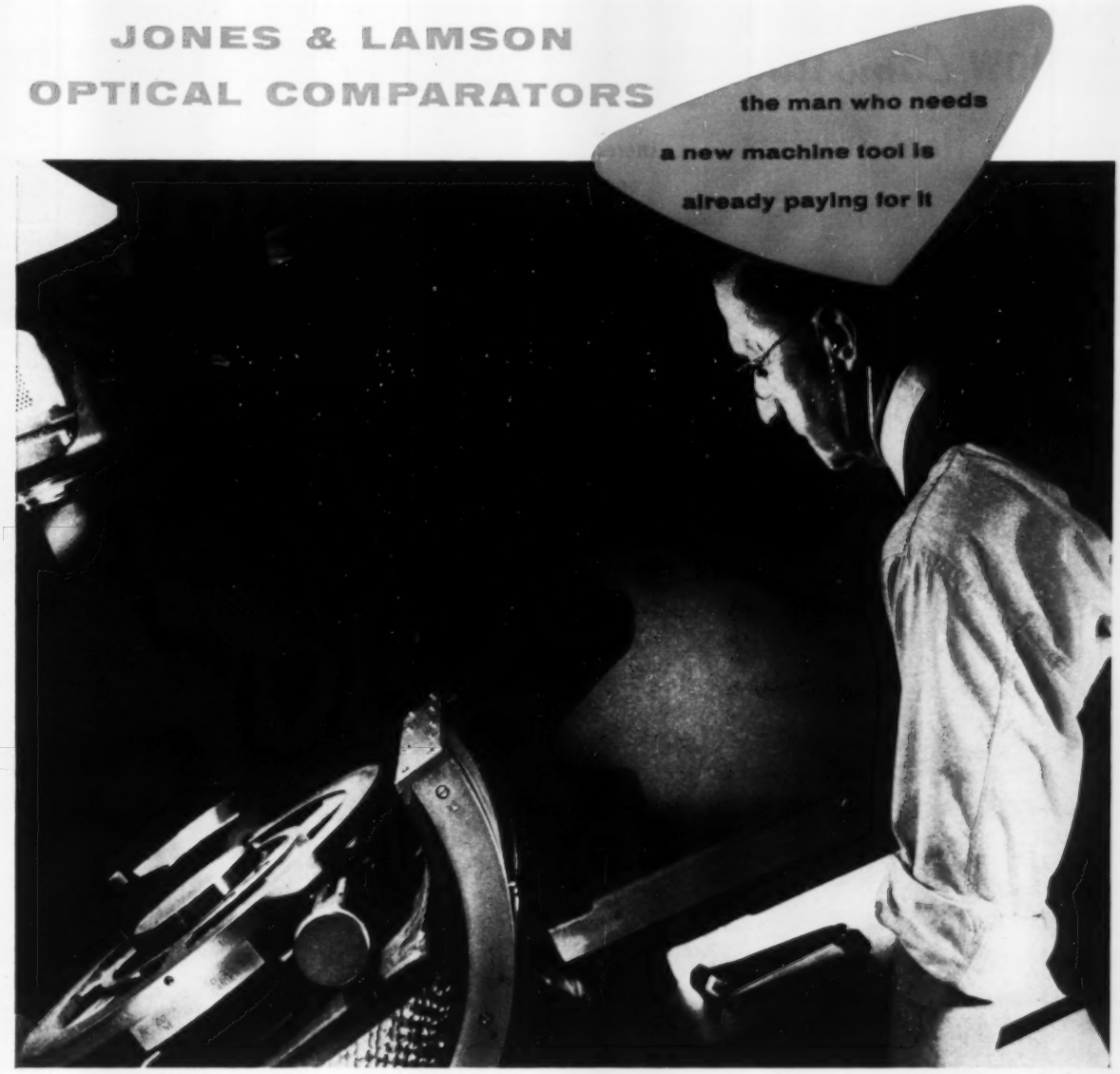
Monitor Protects Furnace

This impulse monitor insures the shutting down of a heat treating furnace for an electric salt bath if a control instrument or relay fails.

Two ranges are available: 0 to 240 minutes or ½ to 30 hours. The monitor is set manually. It responds to the duration of the energy input feeding the furnace.

When the power input to the furnace continues longer than the selected time, the monitor first

JONES & LAMSON OPTICAL COMPARATORS



Simulated machining operations give production control as well as absolute inspection

At J & L we answer an inspection problem by asking, "How was the piece made?"

Take, for instance, this inspection of broached slots in turbine discs. Holding fixtures are similar to those used in the actual broaching operation. Measurements are taken, right and left, as on the broaching machine. During inspection, the part moves in the same planes as it does while it is being machined. And the combination of light, optics and chart act as the cutting tool.

Through this visualization of the machining operation, it is a simple matter for the operator to take measurements on the comparator and then go back to the broaching machine to make any necessary adjustments.

Thus, with J & L, you not only inspect end products but, more importantly, you find out *where* and *when* to adjust the manufacturing process. Write to Jones & Lamson Machine Company, 517 Clinton Street, Springfield, Vermont, for literature.

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HOW *Cambridge* Woven Wire Belts help Heat Treaters

increase uniformity, speed production

By providing continuous movement through heat treating cycles, woven wire conveyor belts eliminate batch handling, increase product uniformity and production capacity in annealing, brazing, quenching, tempering, sintering, etc. EXAMPLE:

Continuous Annealing

MOVING BELT carries a stream of brass light bulb ferrules through furnace for continuous uniform annealing at 1400° F.

OPEN MESH of Cambridge belt allows free circulation of heat around load so that hot spots are eliminated. Open mesh construction also permits rapid drainage in wet processes such as quenching and washing.

ALL-METAL BELT withstands heat up to 2100°F. (as in copper brazing) without damage, provides lasting strength because there are no seams, lacers or fasteners to break or wear.

SPECIAL RAISED EDGES hold parts on belt, are typical of a variety of side and surface attachments available to hold the product during flat or inclined movement.

Cambridge Woven Wire Conveyor Belts are made in any size, mesh or weave, from any metal or alloy, and can be used under a wide range of conditions . . . hot or cold, wet or dry. Call your Cambridge Field Engineer to discuss how you can cut costs with continuous processing on woven wire conveyor belts. Look for his phone number under "Belting, Mechanical" in the Yellow Pages or write for FREE 130-PAGE REFERENCE MANUAL.

The Cambridge Wire Cloth Co.

Department J, Cambridge 11, Maryland

WIRE CLOTH | METAL CONVEYOR BELTS | SPECIAL METAL FABRICATIONS

OFFICES IN PRINCIPAL INDUSTRIAL CITIES

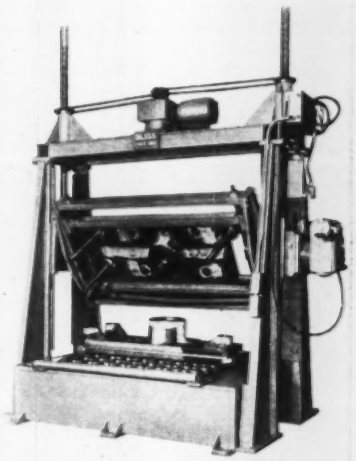
NEW PRODUCTS and equipment

tries to shut off the power. If it cannot do this because of fused contact tips or similar trouble, it triggers an alarm.

A switch inside the monitor bypasses the device during nonnormal operating periods. *Write*: Ajax Electric Co., Laurel and Delaware Avenues, Philadelphia 23, Pa. *Phone*: Nebraska 4-0548

Die Handling Machine

Assembly and disassembly of die sets is speeded and simplified by this machine. It handles sets weighing up to 7000 lb and as large as 24 x 66 in. The machines are built in sizes to handle both large and small die sets.



Special shaped dies can be handled by modifying the slide frame. *Write*: E. W. Bliss Co., Canton, Ohio. *Phone*: 7-3421

Chrome-Nickel Electrode

No. 275 is an electrode (alternating or direct current) for high alloy steels, tool and spring steels, pressure vessels, air hardenable steels, dies, nickel clad steels, and medium and mild carbon steels.

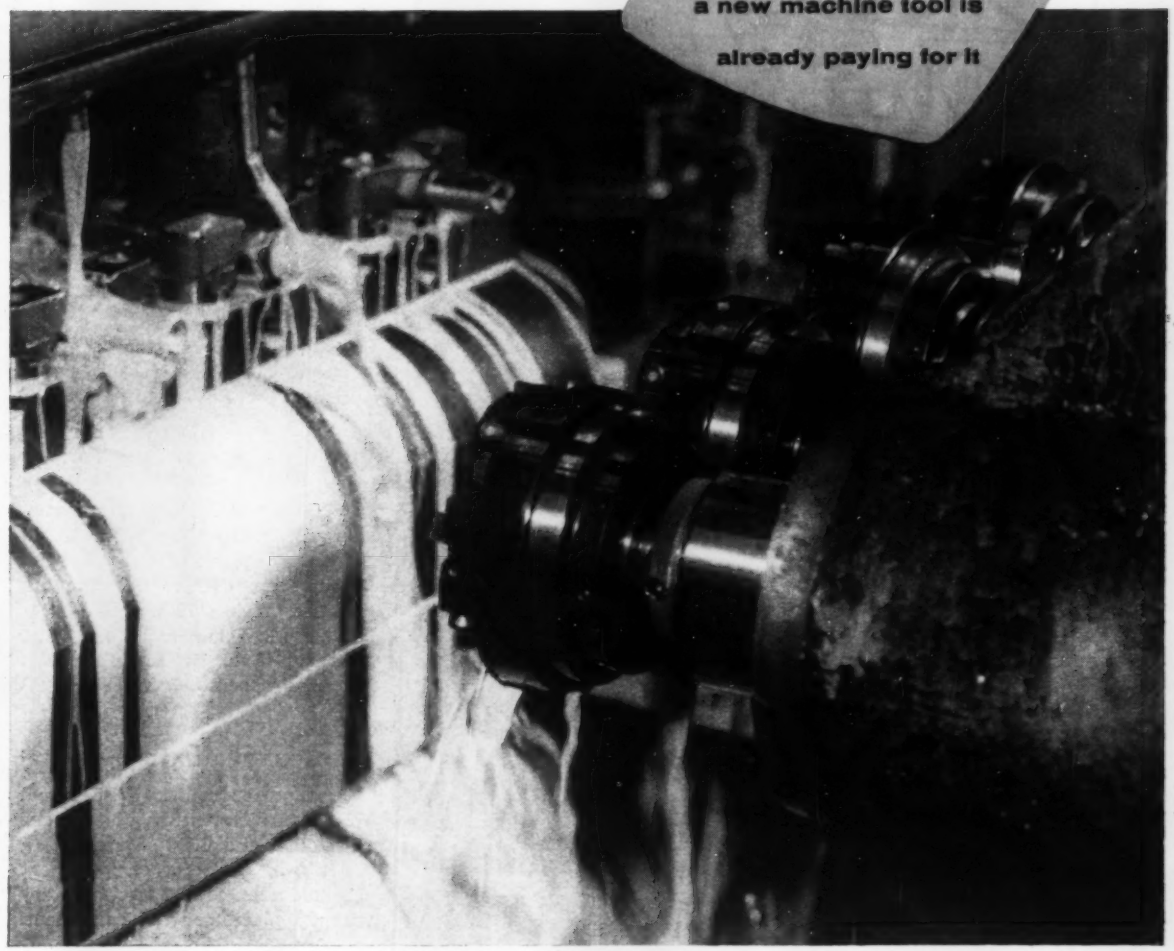
As-welded properties: Tensile strength, 120,000 psi; elongation in 2 in., 35 per cent; hardness, 200 Brinell.

Deposits cannot be heat treated, but can be cold worked to over 180,000 psi tensile.

The electrode coating insures

JONES & LAMSON
THREAD TOOLS

the man who needs
a new machine tool is
already paying for it



Wholesale Hollow Milling with J&L Die Heads

This is part of a transfer machine set-up that uses 48 J & L Die Heads on hollow milling operations. Rough and finish turning is performed on both ends of automotive suspension shafts, as 1440 finished parts come off the line every hour.

Even in single spindle set-ups, hollow milling chasers in J & L Die Heads remove metal *four times faster* than single point tooling. And in many cases, J & L threading Die Heads can be adapted to hollow milling, by merely using the required turning chasers.

Chasers for multiple turning and contour forming, as well as straight or taper turning, can be used in J & L Die Heads for hollow milling on most types of turning equipment.

Write for booklets — "Hollow Milling with Die Heads", and "Let's Talk about Thread Tools". Jones & Lamson Machine Company, 517 Clinton Street, Springfield, Vermont.

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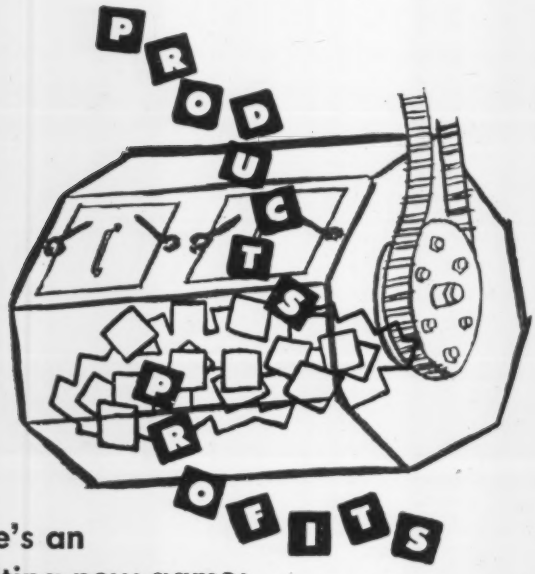


Here's an exciting new game:

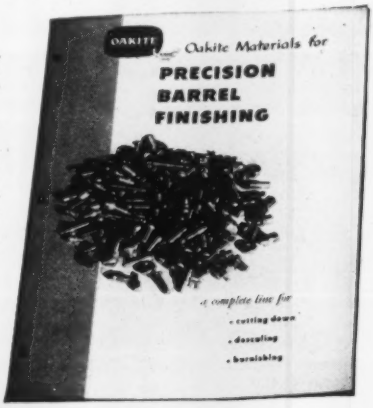
PUT your products in the barrel TAKE your profits out

One of the greatest money-saving opportunities in metalworking lies in the use of barrels to finish parts by the hundreds in place of conventional methods that finish one part at a time.

Barrel finishing makes easy work of many tough jobs of grinding, deburring and buffing by wheel.

One Oakite customer changed to barrel methods to deburr curved stainless steel strips that are 14 inches long. The cost for deburring 20,000 strips was reduced from $3,000 to $125.00.

FREE For a copy of "*Precision Barrel Finishing*" —containing valuable information on cutting down, deburring, descaling, and burnishing—write to Oakite Products, Inc., 34E Rector Street, New York 6, N. Y.



SPECIALIZED INDUSTRIAL CLEANING
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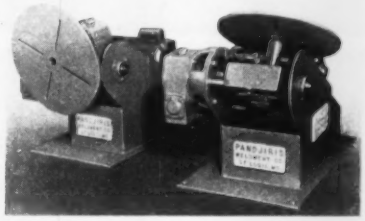
Welding Positioners

This small positioner comes in capacities of 100 and 250 lb. Both have 165 degrees of manual table tilt (30 degrees back tilt).

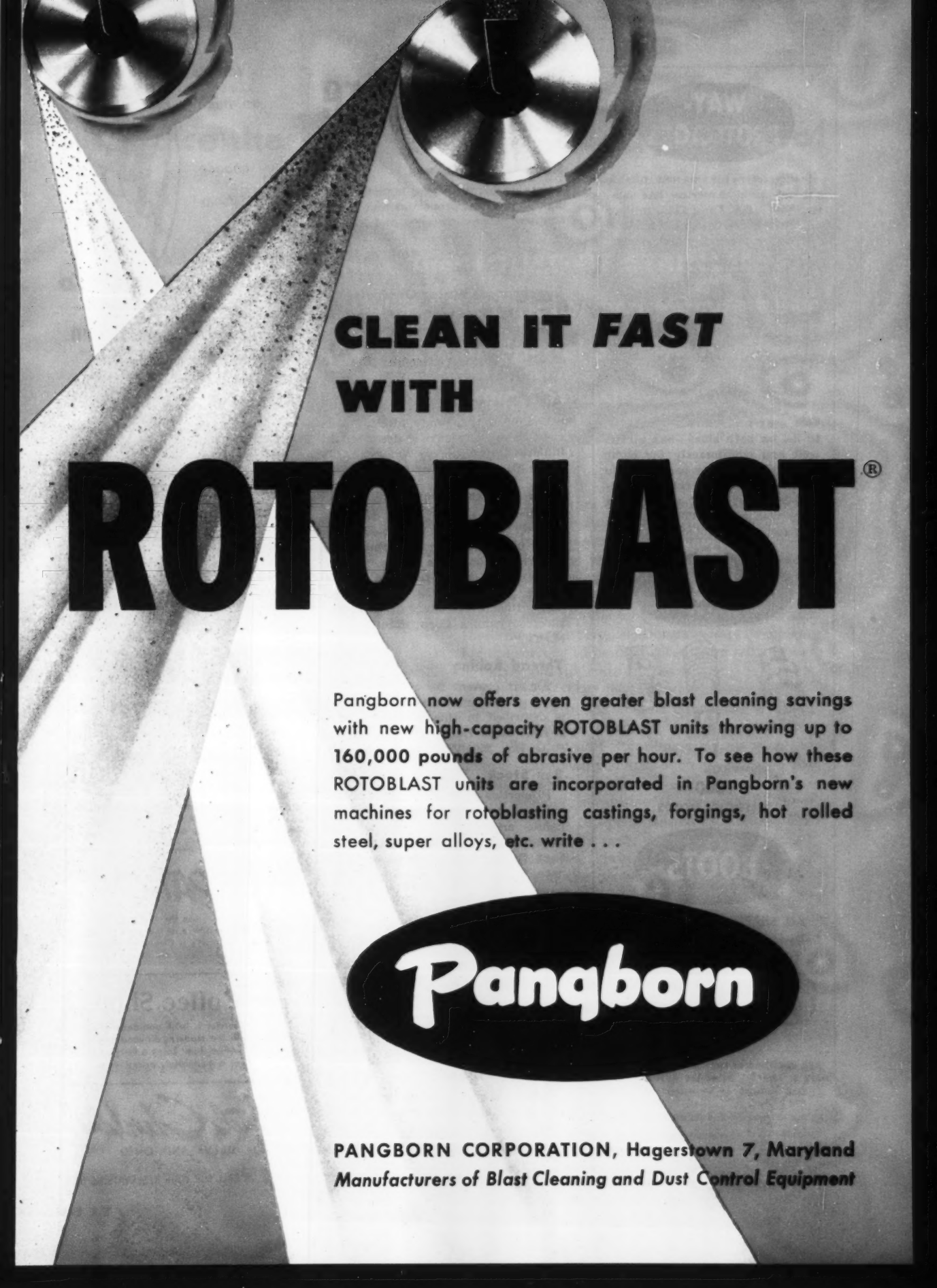


A ¼-hp variable speed transmission powers the table. The 100-lb model has speeds of 1 to 10 rpm. Speeds from 0.52 to 5.2 rpm are obtained on the 250-lb unit. *Write*: Pandjiris Weldment Co., 5151 Northrup Ave., St. Louis 10, Mo. *Phone*: Prospect 6-6893

Trucks Have Extra Power

Transporter models WPY-4 and WPY-6 are low lift pallet trucks with 4000 and 6000 lb capacities. A 15½-in. battery compartment can hold a six-cell lead acid battery with 23 plates, or the equivalent.

The truck is only 29 in. long (plus the length of the load). Maximum steering angle is 200 degrees. *Write*: Automatic Transportation Co., division of Yale & Towne Mfg. Co., 149 W. 87th St., Chicago 20, Ill. *Phone*: Radcliffe 3-7000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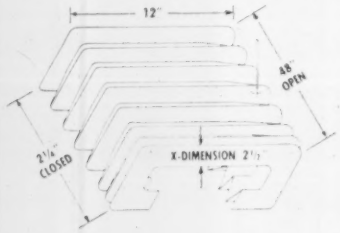
Pangborn
PANGBORN CORPORATION, Hagerstown 7, Maryland
Manufacturers of Blast Cleaning and Dust Control Equipment

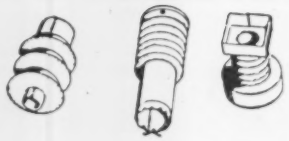
WAY-PROTECTORS

Headquarters for this new, pliable protection in America has centered at A&A. On a G&L milling and boring machine, at Harnischfeger Corporation, a set of pli-



able way-protectors — opening to 24' on both sides—has served well and continuously for eight years: Other major users include —Allis-Chalmers, Cincinnati Milling Machine, K&T and dozens more who use GORTITE protection for profit protection.

SLEEVES



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NEW literature

Write directly to the company for a copy

Nonferrous Castings

Catalog 57, 20 pages, includes listings of physical properties and specifications of magnesium and aluminum alloys. Wellman Bronze & Aluminum Co., 12800 Shaker Blvd., Cleveland 20, Ohio.

Synchronous Motor Controls

Step by step control of synchronous motors in all phases of operation is illustrated in Bulletin GEA-5873B, 8 pages. General Electric Co., Schenectady 5, N. Y.

Air Filtering

Use of a disposable filtering element in air filtration is described in Bulletin 780, 4 pages. American Air Filter Co. Inc., Louisville 8, Ky.

High Vacuum Gages

Bulletin 9-1, 24 pages, describes ranges, operating principles, and uses of Pirani and thermocouple gages and ionization gages. Bulletin 10-1, 28 pages, describes valves, baffles, and traps for high vacuum use. Rochester Div., Consolidated Electrodynamics Corp., Rochester 3, N. Y.

Thread Rolling

An attachment for rolling threads on small automatic screw machines is described in this 8-page bulletin, B-120. Reed Roller Thread Die Co., P. O. Box 350, Worcester 1, Mass.

Bar Stock

Properties and uses of standard bar and tube stock made of Meehanite and Ni-Resist are given in Bulletin 156, 6 pages. Centrifugally Cast Products Div., Shenango Furnace Co., Dover, Ohio.

Plating

This 3-page bulletin describes a high speed bright copper plating process without critical control details. Another 3-page bulletin describes a liquid phosphoric acid type material that prepares metal and removes rust and corrosion before surface treatment. MacDermid Inc., Waterbury, Conn.

Shop Equipment

Work benches, tool stands, shelving and other equipment for shops, laboratories, and assembly lines are covered in this 8-page bulletin. Advertising Dept., Box 579, Standard Pressed Steel Co., Jenkintown, Pa.

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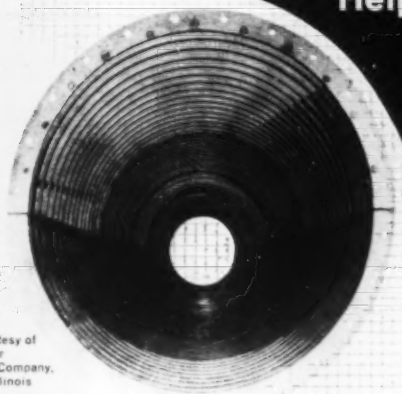
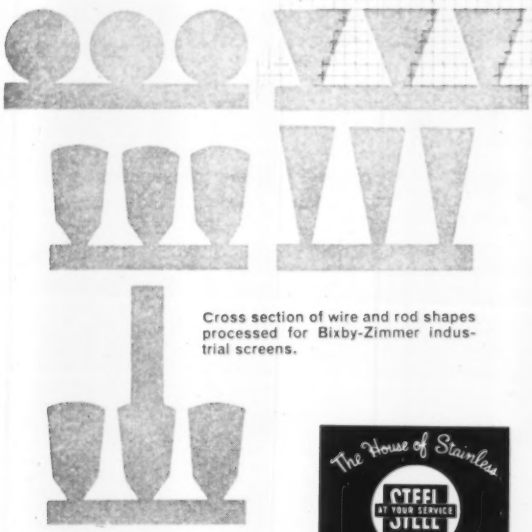
How The HOUSE OF STAINLESS Helped Industrial Screen Manufacturer Create Special Stainless Shapes from "Scratch"



Photos, courtesy of Bixby-Zimmer Engineering Company, Galesburg, Illinois



Cross section of wire and rod shapes processed for Bixby-Zimmer industrial screens.

This manufacturer of industrial screens for sorting, filtering, cleaning and drying, posed an unusually tough material supply problem.

Stainless steel would give them the abrasion and corrosion resistance necessary and it could be formed and welded to meet production requirements. But the problem arose from the fact that the varying applications made it necessary for the screens to be fabricated from wire or rod of extremely intricate shapes.

Producing these shapes in stainless steel presented quite a challenge. However, working closely with B-Z engineers and our producing mill, The House of Stainless came up with the answer—furnishing shapes such as shown in the cross-sections illustrated.

For normal requirements, we can fill your needs from our complete warehouse stocks. For specials, as in this case, we are in daily contact with the leading stainless-producing mills and can give you the benefit of their combined experience and facilities in meeting your requirements—at no extra cost to you.

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Progressive is saving its customers up to 70% on special fasteners. Very likely we can save you thousands of dollars on many of your small metal components.

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Division of The Torrington Company
76 Norwood Street, Torrington, Connecticut

STEEL
November 4, 1957

Market Outlook

OUTLOOK for steel demand the rest of the year is mixed. Some steel producers are noting a decline in their incoming orders, and even a few cancellations of orders on the books; other mills are reporting a slight improvement in new business.

With few exceptions, mills are current on deliveries. The exceptions are principally where wide flange beams and heavy plates are involved, but even here, producers are gaining on their commitments.

INCENTIVE—Idleness of a little more than 20 per cent of the nation's steel ingot capacity spurs steel producers to give the quickest possible delivery, lest orders be lost to competitors.

Consumers know they can get early delivery, and they see no reason to have money tied up in large stocks of raw material. In states where users are subject to yearend inventory taxes there is an additional incentive to reduce the amount of material on hand. As a result, buying is principally for immediate consumption.

PREPARED—To get into position to provide quick delivery, mills built up their stocks of semifinished steel in the last four to six weeks. With that activity finished, the ingot rate will more nearly reflect receipts of new orders. The rate will be a trifle lower than it was even though the flow of new orders holds steady.

OUTPUT EBBS—Such a decline in the ingot rate has been apparent in the last two weeks. In that period, the rate has slipped off 2 points. In the first week, it declined from 81 to 79.5 per cent of capacity. In the week ended Nov. 3, operations edged down to 79 per cent.

The month just ended—October—yielded around 9.2 million net tons of steel for ingots and castings, compared with 8,995,000 tons in September. The increase in tonnage is due solely to the fact October is a 31-day month. September, with one less day, had a larger daily average production.

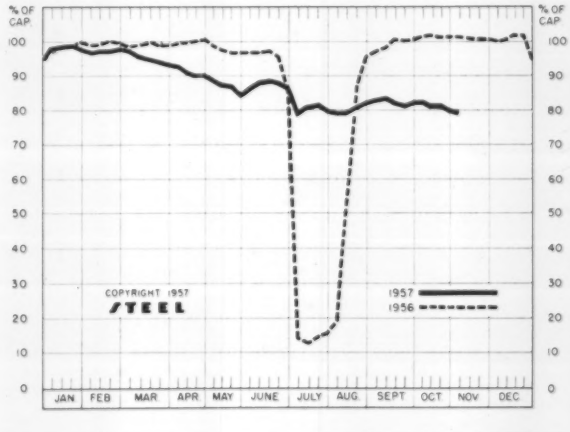
TEN-MONTH TOTAL—October production raised the total for the first ten months to around 96.9 million net tons. Continuation of the current rate of output would make the year's total between 114.5 million and 115 million net tons. The record is 117 million tons (1955). Last year, output was 115 million tons, the second highest in history.

Many observers think steel demand will hold at its present rate the rest of this year, and perhaps well into the first quarter of 1958.

SCRAP FALLS AGAIN—The scrap market reflects such thinking. Prices of steelmaking scrap are dropping at a time when it would be normal for them to rise. The eleventh consecutive week of decline knocked $1.50 from STEEL's scrap price composite. It lowered the composite to $35.33 a gross ton, almost $30 below what it was at the start of this year. Steelmaking scrap is lower now than it was at any time last year.

PREMIUM PRICE FADES—Another premium price on plate mill plates vanished when the Claymont, Del., plant of the Wickwire-Spencer Steel Div., Colorado Fuel & Iron Corp., cut $12 a ton off its quotations on the plain carbon and the carbon abrasive products. The mill's prices are now the same as those of its competitors.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

(Percentage of Capacity Engaged)

	Week Ended Nov. 3	Change	Same Week 1956	Same Week 1955
Pittsburgh	81	0*	100.5	102
Chicago	81.5	— 1.5*	103	99
Mid-Atlantic	82	+ 1	102	97.5
Youngstown	66	+ 1	102	97
Wheeling	67	— 5.5	101.5	98.5
Cleveland	94	+ 0.5*	105	101.5
Buffalo	90	— 5	107.5	105
Birmingham	69	— 2.5	95.5	94
New England	49	— 1	87	91
Cincinnati	82	— 3.5*	85.5	90
St. Louis	92.5	+ 2*	105	106
Detroit	97	— 1*	99.5	97
Western	91	— 1	109	98
National Rate	79	— 0.5	101.5	98

INGOT PRODUCTION‡

	Week Ended Nov. 3	Week Ago	Month Ago	Year Ago
INDEX (1947-1949=100)	126.0†	127.7	131.7	155.2
NET TONS (In thousands)	2,024†	2,052	2,115	2,493

*Change from preceding week's revised rate. †Estimated. ‡Amer. Iron & Steel Institute. Weekly capacity (net tons): 2,559,490 in 1957; 2,461,893 in 1956; 2,413,278 in 1955.

Metalworking Outlook—Page 59 Trends in Metals—Page 107

A welder caused us to caucus

The note from an employee suggestion box read "How come a company like this hasn't got the U. S. Savings Bond Payroll Savings Plan". It was signed by a welder in the fabricating department.

Since we actually *do* have Payroll Savings this told us two things: (1) Probably more employees than we imagined wanted the advantage of buying U. S. Bonds automatically through Payroll Savings. (2) We had grown lax in bringing our Plan to their attention.

But what to do? The solution was simplicity itself.

We called in our State Savings Bonds Director. He provided all the promotional materials needed to arouse interest in U. S. Savings Bonds. Then he helped to conduct a personal canvass and place an application blank in everyone's hands.

The results were amazing. Employee participation shot up to a percentage that we could take pride in. There was no "hard selling", nor was work interrupted. Our people wanted the security U. S. Savings Bonds offer them.

Today there are more Payroll savers than ever before in peacetime. Your State Director will be happy to help you install a Payroll Savings Plan or build enrollment in one already existing. Look him up in the phone book or write: Savings Bonds Division, U. S. Treasury Dept., Washington, D. C.

STEEL
The Metalworking Weekly

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CURRENT INVENTORIES				
UNDER 10 DAYS	10-30 DAYS	30-60 DAYS	60-90 DAYS	3-6 MONTHS
7%	15%	51%	17%	10%
9%	22%	43%	15%	11%
6%	13%	41%	31%	9%
9%	5%	36%	36%	14%
8%	5%	31%	38%	18%
10%	14%	30%	30%	16%
12%	23%	44%	12%	9%
19%	14%	38%	24%	5%

Buyers Forecast 1st Qtr. Inventories

MILL PRODUCTS	LOWER	SAME	HIGHER
HOT-ROLLED CARBON BARS	30%	64%	6%
COLD-FINISHED BARS	28%	63%	9%
H & C R SHEETS, STRIP	33%	62%	5%
LIGHT PLATES	36%	52%	12%
HEAVY PLATES	38%	44%	18%
STRUCTURAL SHAPES	38%	50%	12%
COPPER & BRASS	20%	67%	13%
ALUMINUM	27%	62%	11%

FIGURES are percentages of respondents to STEEL's quarterly survey. COLOR shows how most respondents reported.

Cautious Metal Buyers Trim Stocks

But they build inventories of wide flange beams and heavy plates, still hard to get. With consumption down and money scarce, buying is geared to immediate needs

CONFIDENT they can get mill products as needed, metal buyers are waiting for needs to develop.

As one respondent to STEEL's quarterly survey puts it: "Inventory reduction is deliberate. Consumption is way off, and very little purchasing is contemplated, with the exception of wide flange shapes. On this item, we're still on allocation. But all indications are that the allocation can be stretched if additional material is wanted."

Structurals Ease — In STEEL's previous survey (Aug. 5, Page 137), 17 per cent of the buyers reported difficulty in obtaining structurals; now only 6 per cent have trouble. An Alabama firm says deliveries are still running four to six weeks late. A New Jersey fabricator reports that deliveries are inadequate but improving.

Heavy plates, hard to obtain all year, continue to give buyers more trouble than any other product. In the last three months, however, the percentage of respondents complaining about plate deliveries has declined from 14 to 8. As a safeguard against future shortages, purchasing agents are keeping relatively heavy stocks of plates and structurals (see table). Satisfied with 30 to 60 day inventories in most cases, they maintain 60 to 90 day stocks of the hard-to-get items.

Production Cutbacks — Ninety days ago, none of the survey participants had enough copper or brass to last more than three months. Today, 9 per cent report such inventories. While it's possible that some buyers have added to their stocks, taking advantage of low prices, it's just as likely that longer inventories result from slower consumption.

Aluminum inventories are conspicuously lower now than in recent months. One user in five reports less than 10 days' supply. Probable explanation: Fabricators won't tie up scarce money in a metal that's readily available.

Inventory Shakeups — Comparison of today's inventories with forecasts made three months ago shows that there has been less stability than buyers expected. In August, 70 per cent predicted fourth quarter stocks would be the same; 24 per cent were in the "lower" bracket, and 6 per cent in the "higher." Today, 46 per cent report inventories are unchanged from the August level; 39 per cent say they're lower, and 15 per cent say higher.

Current stocks of hot-rolled carbon bars are considered excessive by 8 per cent of the respondents;

7 per cent report higher than desired inventories of hot-rolled sheets and strip; 6 per cent have more plates than necessary, and 5 per cent say they're overloaded with structurals and seamless tubing.

If it weren't for occasional difficulties in obtaining certain plates and structurals, buyers would be unanimous in declaring that deliveries are satisfactory.

Forecast—Looking ahead to the first quarter of 1958, purchasing agents make these predictions: Six out of 10 say inventories will be the same, three say they'll be lower, and one says higher.

Reduce Epoxy Compounds

Lower prices for development quantities of five epoxy compounds were announced last week by Becco Chemical Div., Food Machinery & Chemical Corp., Buffalo. The new prices: Octylene oxide, $1.10 a pound; dodecene oxide, $1.55; C_{16}-C_{18} olefin oxide, $1.55; dipentene monoxide, $1.20; alpha-pinene oxide, $1.20. Prices include freight and the nonreturnable drum.

These recently introduced materials have many applications, including use as stabilizers for chlorinated compounds; as reactive solvents and diluents for epoxy resins; as intermediates in the preparation of surface-active agents, perfumeries, cosmetics, flavorings, pharmaceuticals, protective coatings, insecticides, bactericides, lubricant additives, adhesives, plasticizers and flotation agents; and as reactants in organic synthesis.

Stainless Steel . . .

Stainless Steel Prices, Page 181

A Pittsburgh area producer reports that sales of stainless steel plate for industrial equipment applications are declining. This market had been a mainstay of stainless sales earlier this year.

In other stainless products, an expected fourth quarter surge in demand for strip failed to develop, with sales to the auto builders slow. The quarter's volume is expected to be no better than that in third quarter.

Demand for stainless steel sheets is lagging badly. One producer says its orders are off fully 50 per cent from year-ago levels. Solid stainless plates are available for delivery in four weeks.

Sheets, Strip . . .

Sheet & Strip Prices, Pages 178 & 179

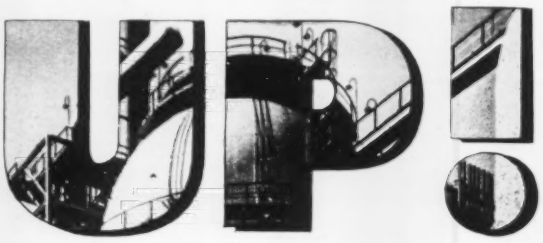
Sheet fabricators are operating at a fairly good rate, but with mill shipments of sheets readily available on short notice, they are not making any effort to build inventories. Actually, they are letting their stocks shrink, a situation that may continue.

Deliveries of hot-rolled sheets are available in two to three weeks, and cold rolled in three to four weeks. Galvanized sheets can be had virtually out of stock. Trading in specialties is spotty.

About the most that can be said for the sheet market is that it is having difficulty holding its own. Cold-rolled sheets seem to be in a little more active demand than hot rolled. Enameling stock and electrical sheets are showing little life.

High grade electrical sheets

HOW TO KEEP PRODUCTION UP



A few generations ago, John Ruskin had a few penetrating remarks to register on business—and what he said makes a lot of sense today.

"The common law of business practice," he commented, "prohibits paying a little and getting a lot. If you deal with the lowest bidder, it's well to add something for the risk you run. And if you do that, you will have enough left over for something better."

Let's translate this in terms of furnace construction for refineries. If you buy a heat enclosure for a job where high and continuous production is a must, then it's imperative that you invest in one that will stand the gaff. To make sure, you've got to build a unit which is properly engineered for the job it must do. You pay more, of course. But it's poor economy—and often embarrassing—to plow money back into repairs right at the peak of production.

That's all we have to say. You get sound engineering and a job designed to stay on stream when you come to Bigelow-Liptak. We've been designing refinery furnaces for years—erecting them, too. Both suspended and castable construction—the one that's best for the job—are used. Better investigate—right now!

FIRST COST OF AN INFERIOR JOB

PLUS REPAIRS AND LOST PRODUCTION

FIRST COST OF A BIGELOW-LIPTAK JOB

BIGELOW-LIPTAK CORPORATION

AND BIGELOW-LIPTAK EXPORT CORPORATION

13300 PURITAN AVENUE, DETROIT 27, MICHIGAN

UNIT-SUSPENDED WALLS AND ARCHES

have been fairly active the greater part of this year, but now they are in noticeably slower demand due to shrinking requirements for heavy electrical equipment.

Generally, sheet suppliers are dropping earlier predictions of an upturn in sales. With demand declining from several consuming areas, Pittsburgh mills say automotive tonnage, while up some, is not sufficiently heavy to add needed volume. Expectations are automotive requirements, based on present estimates, will be smaller in December than they were in October.

Steel Bars . . .

Bar Prices, Page 177

Hot carbon bar business is a shade better at some market centers, but most consumers are buying hand-to-mouth. They are having no difficulty getting tonnage for nearby delivery. Only an appreciable surge in requirements for their own finished products will cause bar consumers to step up specifications.

Suppliers of hot bars at Pittsburgh report October shipments are slightly heavier than those in September. But producers are predicting a sales decline during the closing two months of this quarter.

Farm equipment bar purchases have been better lately, but automotive buying still lacks zip.

Cold-drawn bar operations in New England are at 60 to 65 per cent of capacity. Converters are still drawing on hot bar inventories. Alloy bars are slow with defense volume slackening. Contrary to the general trend, stainless steel bar demand is up slightly, forging billets accounting for a fair share of the increase.

Tubular Goods . . .

Tubular Goods Prices, Page 181

The Youngstown Sheet & Tube Co. last week shipped the first carload of seamless oil well casing from its new No. 3 seamless mill at the Indiana Harbor Works, East Chicago, Ind. Two new seamless plants are now in production. A third will go into operation by the second quarter, 1958. The company also operates seamless mills at its Youngstown District Works.

Most tubular product makers face declining sales in the remainder of the fourth quarter. Oil country tubing and line pipe, though, still are in strong demand.

Other tubular goods are subject to inventory reductions. Sales of buttweld pipe for housing applications are falling off rapidly. This is a seasonal development.

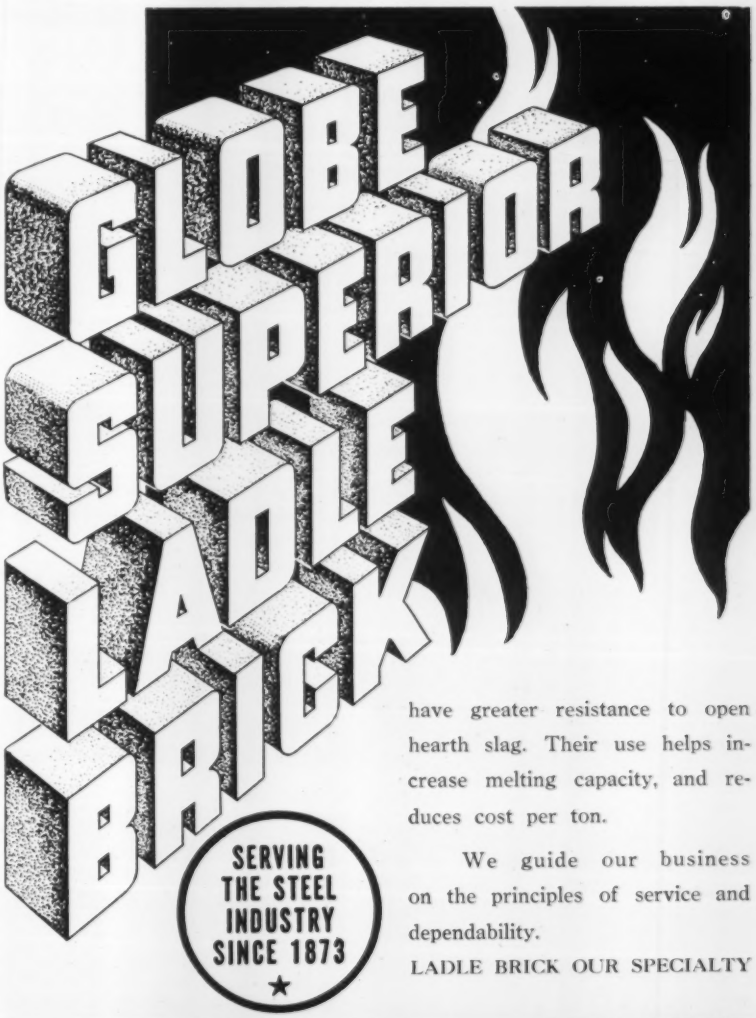
Users of mechanical tubing are cutting stocks, but sales of pressure tubing for boilers are firm, with a good backlog of unfilled orders, extending into 1958. Demand for pressure tubes from producers of heat exchangers and condensers has fallen off. The outlook is for continued decline in November and December.

Wire . . .

Wire Prices, Pages 179 & 180

Mill schedules appear to be wide open on most wire products, with demand easy and deliveries prompt. Inquiry for merchant items is reported at a virtual standstill at some points.

A moderate increase in buying brought October bookings slightly



have greater resistance to open hearth slag. Their use helps increase melting capacity, and reduces cost per ton.

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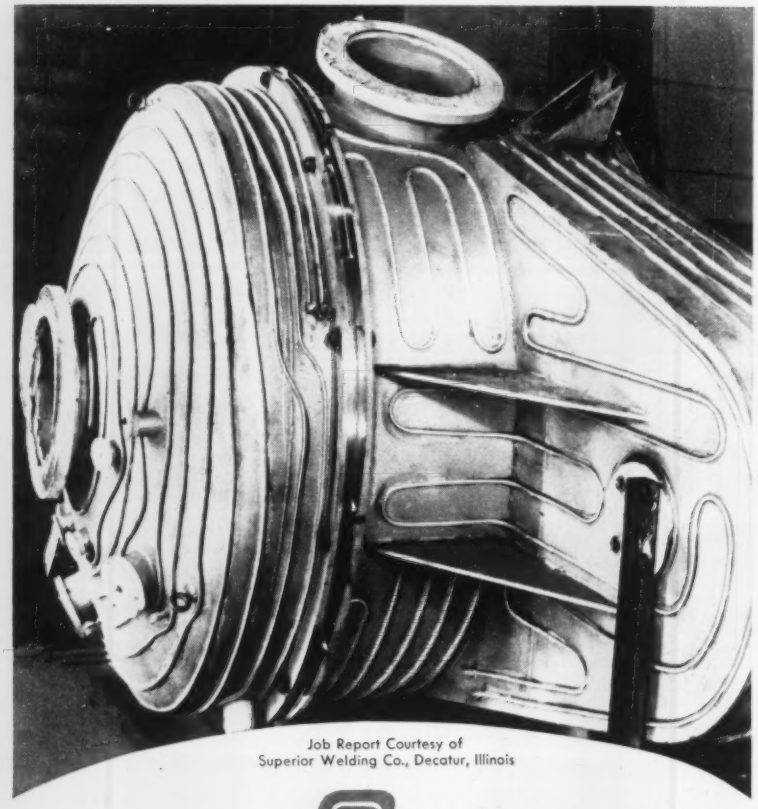
LADLE BRICK OUR SPECIALTY

The GLOBE BRICK Co.
EAST LIVERPOOL, OHIO

When stainless welds must be VACUUM TIGHT



Job Report Courtesy of
Superior Welding Co., Decatur, Illinois

WELD WITH ARCOS

STAINLESS ELECTRODES

Shown here is a stainless steel furnace body of type 304 ELC for use under very high vacuum conditions in the casting of metals where exceptional purity is required. Arcos Chromend K-LC Stainless Electrodes were used because Arcos electrodes not only assured the proper weld metal chemistry, but also the necessary soundness to insure vacuum tight welds. Save money and future problems with long-lasting Arcos-produced welds. ARCOS CORPORATION, 1500 S. 50th Street, Philadelphia 43, Pa.

above the third quarter average in New England. But business added little to mill backlogs. Orders have been largely for prompt shipments. Incoming volume for November is slow.

Consumers' inventories are not heavy, but with prompt deliveries available on most products through the remainder of this year, anticipatory buying is being held to a minimum. Where users are subject to yearend inventory taxes, there is no desire to increase stocks.

Plates . . .

Plate Prices, Page 177

The keel for the first atomic-powered service ship, the cruiser *Long Beach*, will be laid at Bethlehem's Quincy, Mass., yard Dec. 2. General Electric's West Lynn, Mass., plant will build propulsion turbines, and Westinghouse Electric Corp., Pittsburgh, the atomic reactor.

Producers appear to be gradually getting caught up on commitments for heavy sheared plates, though one large eastern mill is still six weeks behind on deliveries. Supplies of light sheared plates are ample; strip-plates and universal plates are readily available.

Consumers are buying largely on a hand-to-mouth basis. In New England, tank and weldment shop backlogs are smaller, resulting in heavier plate inventories. Clad and semifabricated specialties are less active. Solid stainless plates are available in four weeks.

At Pittsburgh so-called "gray" market plate has disappeared; brokers are offering tonnage at close to mill levels. Reflecting the easier tone in the market, the Claymont Products Dept., Colorado Fuel & Iron Corp., Claymont, Del., has dropped premium prices on plain carbon plates and abrasive resistance plates, quoting $5.10 and $6.75. The reduction is $12 a ton in each case.

Iron Ore . . .

Iron Ore Prices, Page 184

Shipments of Lake Superior iron ore totaled 2,356,184 gross tons in the week ended Oct. 28, reports the American Iron Ore Association. This compared with 2,771,274 tons moved in the like week last year.

Cumulative shipments to Oct. 28 are reported at 79,360,921 tons, against 65,771,733 to the same date in 1956.

Republic Steel Corp., Cleveland, has closed down its Fisher Hill mine at Mineville, N. Y. About 130 employees are affected. Two other mines of the company at Mineville are not affected.

Warehouse . . .

Warehouse Prices, Page 182

Sluggish demand for steel products at the mill level is being duplicated to large extent in the warehouse market. Distributors' volume is fair, but sellers see little change in prospect for November as contrasted with October.

Most distributors report fairly well balanced inventories. This even applies to wide flange sections and heavy plates. They hold ample supplies of standard shapes, light plates, and other major products. Sheets are readily available. So are bars.

Figures of a large Pacific Northwest jobber show its sales volume is down 20 per cent from what it was a year ago, but orders have increased (in number) by 30 per cent. It means buyers have been taking smaller tonnage, being more cautious with respect to inventories.

Little interest is noted in the Pacific Northwest in offerings of foreign steel. Some items imported months ago from Japan and Europe are still in area warehouses.

Pig Iron . . .

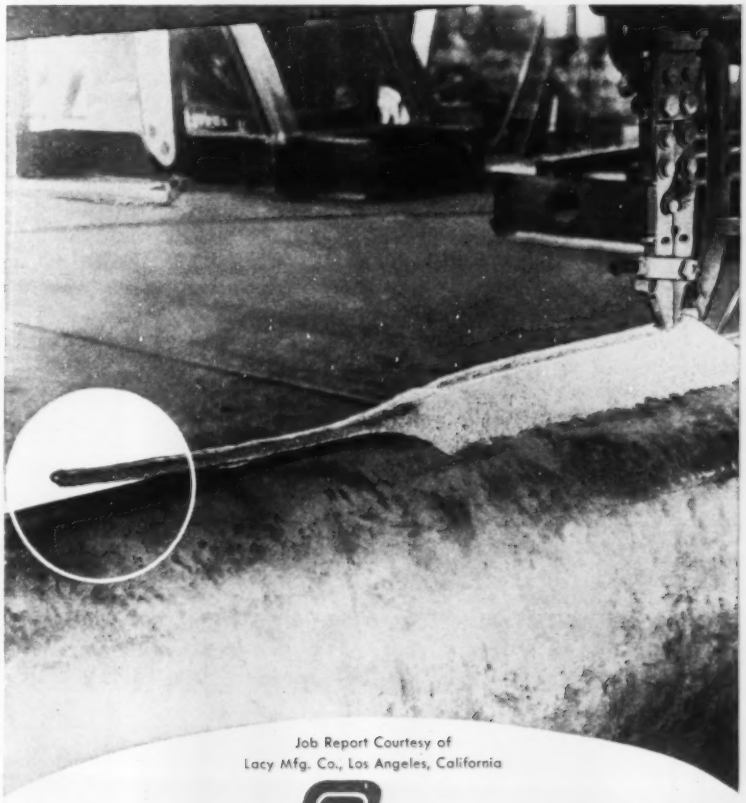
Pig Iron Prices, Page 182

The trend in merchant pig iron business continues downward. Sellers report a slight shrinkage in October (when usually the trend is up), and they expect further declines.

Lower building construction and reduced activity in the appliance industry are the principal causes for the reduced volume in the gray iron market. Demand for automotive castings is not up to expectations either.

Foundry operations are averaging less than four days a week. Gray iron shops are operating

Now, submerged arc stainless welds with slag that "pops-off"



Job Report Courtesy of
Lacy Mfg. Co., Los Angeles, California

WELD WITH ARCOS

Stainless Wire and Arcosite Flux

Arcos research and experience with stainless weld metal now pays you *another dividend*—for the first time . . . consistently *self removing slag!* On the job above, submerged arc welding of a section of pipe for petroleum equipment, two passes were made with 1/8" coiled CHROMENAR KMo Stainless Wire and ARCOSITE S-4 Flux. As the photo shows, the cooling slag is lifting free by itself . . . leaving a clean, smooth bead. Think what this can mean to you on your own submerged arc welding jobs . . . saving time and money . . . better welds than ever before. ARCOS CORPORATION, 1500 S. 50th St., Philadelphia 43, Pa.

about 60 per cent of normal; steel foundries a little better.

The iron market is further depressed by lack of export buying and by the drop in consumption of hot metal in steelmaking. With most steel mills operating their blast furnaces in excess of current requirements, iron is beginning to pile up.

U. S. Steel Corp. lighted a third blast furnace, *Patricia*, at its Fairless Works, Fairless Hills, Pa. This unit will increase the plant's iron-making capacity by 50 per cent. The furnace has a 28-ft hearth, and 1600-ton daily capacity.

Madeline No. 4 blast furnace of Inland Steel Co., East Chicago, Ind., down for relining since Oct. 1, will resume in early December with increased capacity. Its hearth is being increased to 20 ft 9 in. from 20 ft. Cutting down of the stack's thickness will increase its working volume by an estimated 50 tons a day.

No. 2 stack at the works underwent a similar enlargement earlier this year. Its hearth was increased from 19 ft to 19 ft 9 in., giving it a 5.7 per cent increase in working volume.

Structural Shapes . . .

Structural Shape Prices, Page 177

By the end of this year, it is thought most producers of wide flange structurals will be pretty well abreast of commitments on most sizes. They are already caught up on standard sections.

The improved supply position in plain material reflects, in part, tapering off in structural demand, especially industrial and commercial work.

In the East, several sizable jobs are pending. Bids have been opened on 17,500 tons of shapes and 4000 tons of cable for a suspension bridge and approaches at Throgg's Neck, New York, for the Triboro Bridge & Tunnel Authority. This job will eventually require 52,500 tons of shapes and miscellaneous steel.

More New York state bridge work is coming up for figures also, and there are several miscellaneous building jobs of good size pending, including a 7000-ton powerplant in Astoria, N. Y.

Only demand for educational buildings is holding up at earlier levels in New England. This class of construction takes a minimum volume of wide flange sections. Industrial and commercial estimating is lower in the area, and active district bridge volume involves under 2000 tons. Vermont takes bids next spring on 8360 tons, but plans for 1958 bridge programs lag in other northeast states. American Bridge Div., U. S. Steel Corp., Pittsburgh, booked 6200 tons for the Connecticut River bridge at Glastonbury, Conn.

With mill shipments of shapes improving steadily at Pittsburgh, construction firms are expected to cut their inventories between now and yearend. Bridge builders in the area expect brisk business next year.

West coast fabricators are bidding on a series of highway and school projects that were held up last summer because of strikes. Bidding is brisk. Fabricators in the Pacific Northwest are seeking new work with current backlogs barely extending beyond this quarter.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

11,000 tons, state bridge work, Bronx, New York, through the Slattery Contracting Co., general contractor, to the Harris Structural Steel Co., New York.

6200 tons, superstructure, Connecticut River bridge, Greater Hartford Authority, Glastonbury-Wethersfield, Conn., to American Bridge Div., U. S. Steel Corp., Pittsburgh.

2600 tons, state bridge work, York County, Pennsylvania, through the Lycoming Construction Co., Williamsport, Pa., general contractor, to the Lehigh Structural Steel Co., Allentown, Pa.

1550 tons, railroad subway, Forrest Park, Chicago, to American Bridge Div., U. S. Steel Corp., Pittsburgh.

770 tons, buildings, Cincinnati Chemical Co., Toms River, N. J., through M. W. Kellogg Co., New York, to the Elizabeth Iron Works, Elizabeth, N. J.

725 tons, angles, General Stores Supply Office, Navy, Philadelphia; 347 tons, Bethlehem Pacific Coast Steel Corp., San Francisco, and 378 tons, Jones & Laughlin Steel Corp., Pittsburgh.

675 tons, Bureau of Roads bridge, Nisqually River, Washington State, reported placed with West Coast Steel Co., Portland, Oreg.; Halvorson & Co., Portland, general contractor.

675 tons, seven-span bridge, near Montgomery (Kendall County), Ill., to Bethlehem Steel Co., Bethlehem, Pa.

650 tons, Bureau of Roads bridge, Wind River, Washington State, reported placed with Founght & Co., Portland, Oreg.; C. M. Corkum, Portland, general contractor.

620 tons, bridge, Harrisburg-Baltimore Expressway, Parkton, Md., through DeLuca-Davis Construction Co., general contractor, Baltimore, to the Harris Structural Steel Co., New York.

600 tons, unit, Erie Mining Co., Aurora, Minn., to the Bethlehem Steel Co., Bethlehem, Pa.

590 tons, three grade separations, Northwest Expressway, Chicago, to Hansell-Elcock Co., Chicago.

325 tons, railroad subway extension, Des Plaines Avenue and Congress Expressway, Chicago, to Wendnagel & Co. Inc., Chicago.

250 tons, angles, General Stores Supply Office, Navy, Philadelphia, to Knoxville Iron Co., Knoxville, Tenn.

STRUCTURAL STEEL PENDING

52,500 tons, Throggs Neck bridge, between Bronx and Queens, Triboro Bridge & Tunnel Authority, New York, pending: 17,500 tons for towers and anchorages, Bethlehem Steel Co., Bethlehem, Pa., low bidder (about 7000 tons will be used for the tower piers, on the construction of which Merritt-Chapman & Scott Corp., New York, is low bidder); 4000 tons for cables and hangars, American Bridge Div., U. S. Steel Corp., Pittsburgh, low bidder; award of these contracts is expected shortly, leaving about 31,000 tons of shapes and miscellaneous requirements to be asked for later; bids for the bridge deck will probably be asked late this year and for the approach work, early next year; over-all, the project will require 32,500 tons of shapes and miscellaneous steel for the main suspension bridge and 20,000 tons for the approaches; Ammann & Whitney, New York, is designer of the bridge, and E. Lionel Pavlo, New York, is designer of the approaches.

8500 tons, plate girder approaches, and superstructures, truss span bridge, superstructures, Missouri River, Boone and Cooper counties, Mo., to Stupp Bros. Bridge & Iron Co., St. Louis.

8360 tons, state highway bridges, Vermont; sites under inspection preliminary to openings for steel contracts in the spring; included are 3000 tons, concrete reinforcing bars.

7000 tons, powerplant, unit No. 4, Astoria, for Consolidated Edison Co. of New York Inc., New York; bids Nov. 8.

3000 tons, race track, Monticello Racing Co., Sullivan County, N. Y.

2900 tons, Chrystie Street subway section, Transit Authority, lower Manhattan, New York, through Cayuga Foundation, general contractor, to Grand Iron Works, New York (Bronx).

2650 tons, comprising two office units of 1400 and 1250 tons, respectively, Prudential Insurance Co. of America Inc., Newark, N. J., bids closed Oct. 29; this is in addition to two units let some time ago.

2150 tons, two Jesse Secoles apartments, Third Avenue, New York (Manhattan), to Dreier Structural Steel Co. Inc., New York (Queens).

2000 tons, Kleban office building, 410 Park Ave., New York; bids asked.

1900 tons, state bridge work, Onondaga County, N. Y., Bero Construction Co., Waterloo, N. Y., low on general contract.

PLATES . . .

PLATES PLACED

650 tons, tanks, Waterworks Department, Lafayette, Ind., to Chicago Bridge & Iron Co., Chicago.

295 tons, General Stores Supply Office, Navy, Philadelphia, to Columbia-Geneva Div., U. S. Steel Corp., San Francisco.

265 tons, heat treated, Navy Purchasing Office, Washington, D. C., to Lukens Steel Co., Coatesville, Pa.

240 tons, General Stores Supply Office, Navy, Philadelphia, to Columbia-Geneva Div., U. S. Steel Corp., San Francisco.

225 tons, General Stores Supply Office, Navy, Philadelphia, to Bethlehem Steel Co., Bethlehem, Pa.

200 tons, grade 2, Watertown (Mass.) Arsenal, to the Bethlehem Steel Co., Bethlehem, Pa.

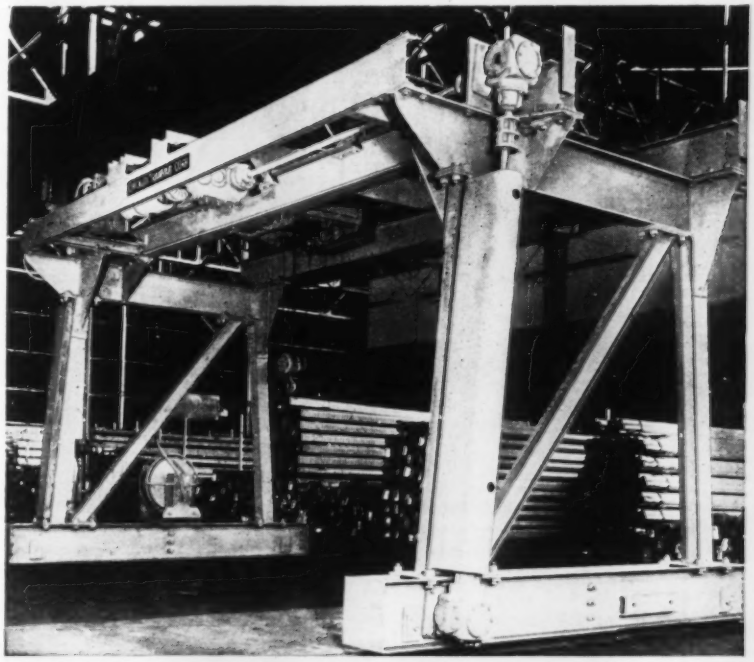
155 tons, 500,000-gal elevated water tank, Flint, Mich., to Pittsburgh-Des Moines Steel Co., Pittsburgh.

135 tons, water tank, Franklin, La., to Hammond Iron Works, Warren, Pa.

125 tons, standpipe, Canton, Mass., to Pittsburgh-Des Moines Steel Co., Pittsburgh.

PLATES PENDING

1100 tons, four oil storage tanks Gulf Oil Co., Pittsburgh; bids asked.



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At the modern plant of one of the country's largest aluminum companies, Chicago Tramrail Gantry Cranes handle long extruded pieces from a 14,000-ton extrusion press . . . transfer these pieces to other operations throughout the mill.

Fourteen Chicago Tramrail Full Gantry Cranes provide individual handling equipment for individual operations to eliminate waste time waiting for busy overhead cranes. Designed for heavy-duty, continuous service, these Gantries are built with maximum headroom and maximum clearance between legs to operate independently under the large overhead cranes.

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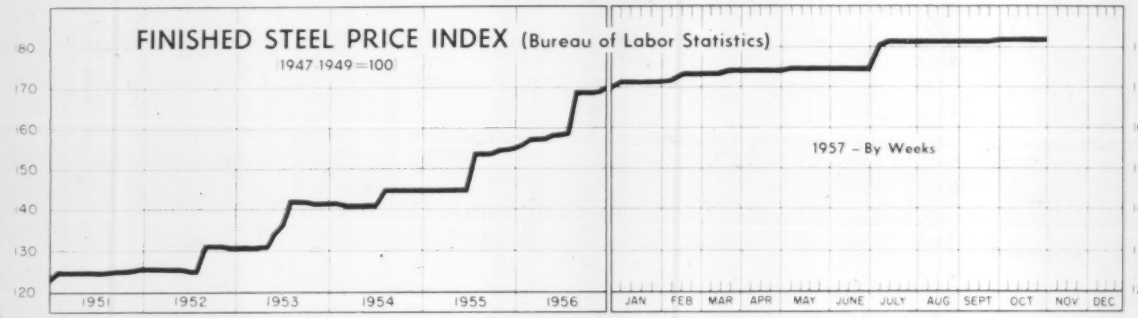
Price Indexes and Composites



Oct. 29, 1957	Week Ago	Month Ago	Oct. Avg.	Year Ago
181.7	181.7	181.7	181.7	168.6

AVERAGE PRICES OF STEEL (Bureau of Labor Statistics)

Week Ended Oct. 29

Prices include mill base prices and typical extras and deductions. Units are 100 lb except where otherwise noted in parentheses. For complete description of the following products and extras and deductions applicable to them, write to STEEL.

Rails, Standard No. 1	$5.600	Bars, Reinforcing	6.210
Rails, Light, 40 lb	7.067	Bars, C.F., Carbon	10.360
Tie Plates	6.600	Bars, C.F., Alloy	13.875
Axles, Railway	9.825	Bars, C.F., Stainless, 302 (lb)	0.553
Wheels, Freight Car, 33 in. (per wheel)	60.000	Sheets, H.R., Carbon	6.192
Plates, Carbon	6.150	Sheets, C.R., Carbon	7.089
Structural Shapes	5.942	Sheets, Galvanized	8.220
Bars, Tool Steel, Carbon (lb)	0.535	Sheets, C.R., Stainless, 302 (lb)	0.688
Bars, Tool Steel, Alloy, Oil Hardening Die (lb)	0.650	Sheets, Electrical	12.025
Bars, Tool Steel, H.R., Alloy, High Speed, W 6.75, Cr 4.5, V 2.1, Mo 5.5, C 0.60 (lb)	1.355	Strip, C.R., Carbon	9.243
Bars, Tool Steel, H.R. Alloy, High Speed, W18, Cr 4, V 1 (lb)	1.850	Strip, C.R., Stainless, 430 (lb)	0.493
Bars, H.R., Alloy	10.525	Strip, H.R., Carbon	6.245
Bars, H.R., Stainless, 303 (lb)	0.525	Pipe, Black, Buttweld (100 ft)	19.814
Bars, H.R., Carbon	6.425	Pipe, Galv., Buttweld (100 ft)	23.264
		Pipe, Line (100 ft)	199.023
		Casing, Oil Well, Carbon (100 ft)	194.499
		Casing, Oil Well, Alloy (100 ft)	304.610
		Tubes, Boiler (100 ft)	49.130
		Tubing, Mechanical, Carbon (100 ft)	24.953
		Tubing, Mechanical, Stainless, 304 (100 ft)	205.608
		Tin Plate, Hot-dipped, 1.25 lb (95 lb base box)	9.783
		Tin Plate, Electrolytic, 0.25 lb (95 lb base box)	8.483
		Black Plate, Canmaking Quality (95 lb base box)	7.583
		Wire, Drawn, Carbon	10.225
		Wire, Drawn, Stainless, 430 (lb)	0.653
		Bale Ties (bundles)	7.967
		Nails, Wire, 8d Common	9.828
		Wire, Barbed (80-rod spool)	8.719
		Woven Wire Fence (20-rod roll)	21.737

STEEL's FINISHED STEEL PRICE INDEX*

	Oct. 30 1957	Week Ago	Month Ago	Year Ago	5 Yr Ago
Index (1935-39 avg=100)	239.15	239.15	239.15	225.58	181.31
Index in cents per lb	6.479	6.479	6.479	6.111	4.912

STEEL's ARITHMETICAL PRICE COMPOSITES*

Finished Steel, NT	$146.03	$146.03	$146.03	$137.48	$110.98
No. 2 Fdry Pig Iron, GT	66.49	66.49	66.49	62.63	55.04
Basic Pig Iron, GT	65.99	65.99	65.99	62.18	54.66
Malleable Pig Iron, GT	67.27	67.27	67.27	63.41	55.77
Steelmaking Scrap, GT	35.33	36.83	42.17	58.67	43.00

*For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point

FINISHED STEEL	Oct. 30 1957	Week Ago	Month Ago	Year Ago	5 Yr Ago
Bars, H.R., Pittsburgh	5.425	5.425	5.425	5.075	3.95
Bars, H.R., Chicago	5.425	5.425	5.425	5.075	3.95
Bars, H.R., deld., Philadelphia	5.725	5.725	5.725	4.93	4.502
Bars, C.F., Pittsburgh	7.30*	7.30*	7.30*	6.85*	4.925
Shapes, Std., Pittsburgh	5.275	5.275	5.275	5.00	3.85
Shapes, Std., Chicago	5.275	5.275	5.275	5.00	3.85
Shapes, deld., Philadelphia	5.545	5.545	5.545	5.00	4.13
Plates, Pittsburgh	5.10	5.10	5.10	4.85	3.90
Plates, Chicago	5.10	5.10	5.10	4.85	3.90
Plates, Coatesville, Pa.	5.10	5.10	5.50	5.25	4.35
Plates, Sparrows Point, Md.	5.10	5.10	5.10	4.85	3.90
Plates, Claymont, Del.	5.70	5.70	5.70	5.35	4.35
Sheets, H.R., Pittsburgh	4.925	4.925	4.925	4.675	3.775
Sheets, H.R., Chicago	4.925	4.925	4.925	4.675	3.775
Sheets, C.R., Pittsburgh	6.05	6.05	6.05	5.75	4.575
Sheets, C.R., Chicago	6.05	6.05	6.05	5.75	4.575
Sheets, C.R., Detroit	6.05-6.15	6.05-6.15	6.05-6.15	5.75-5.85	4.775
Sheets, Galv., Pittsburgh	6.60	6.60	6.60	6.30	5.075
Strip, H.R., Pittsburgh	4.925	4.925	4.925	4.675	3.75-4.225
Strip, H.R., Chicago	4.925	4.925	4.925	4.675	3.725
Strip, C.R., Pittsburgh	7.15	7.15	7.15	6.85	5.10-5.80
Strip, C.R., Chicago	7.15	7.15	7.15	6.85	5.35
Strip, C.R., Detroit	7.25	7.25	7.25	6.95	5.30-6.05
Wire, Basic, Pittsburgh	7.65	7.65	7.65	7.20	5.10-5.225
Nails, Wire, Pittsburgh	8.95	8.95	8.95	8.20	6.20-6.35
Tin plate (1.50 lb) box, Pitts.	$10.30	$10.30	$10.30	$9.85	$8.95

*Including 0.35c for special quality.

SEMIFINISHED STEEL					
Billets, forging, Pitts. (NT)	$96.00	$96.00	$96.00	$91.50	$70.50
Wire rods, 7/32-5/8" Pitts.	6.15	6.15	6.15	5.80	4.325

PIG IRON, Gross Ton	Oct. 30 1957	Week Ago	Month Ago	Year Ago	5 Yr Ago
Bessemer, Pitts.	$67.00	$67.00	$67.00	$63.50	$55.50
Basic, Valley	66.00	66.00	66.00	62.50	54.50
Basic, deld., Phila.	70.01	70.01	70.01	66.26	59.25
No. 2 Fdry, NevilleIsland,Pa.	66.50	66.50	66.50	63.00	55.00
No. 2 Fdry, Chicago	66.50	66.50	66.50	63.00	55.00
No. 2 Fdry, deld., Phila.	70.51	70.51	70.51	66.76	59.75
No. 2 Fdry, Birm.	62.50	62.50	62.50	59.00	51.38
No. 2 Fdry(Birm.)deld.Cin.	70.20	70.20	70.20	66.70	58.93
Malleable, Valley	66.50	66.50	66.50	63.00	55.00
Malleable, Chicago	66.50	66.50	66.50	63.00	55.00
Ferromanganese, Duquesne	245.00†	245.00†	245.00†	235.00†	228.00*

†74-76% Mn, net ton. *75-82% Mn, gross ton, Etna, Pa.

SCRAP, Gross Ton (Including broker's commission)					
No. 1 Heavy Melt, Pittsburgh	$35.50	$37.50	$42.50	$57.50	$44.00
No. 1 Heavy Melt., E. Pa.	36.50	38.00	41.00	57.50	41.50
No. 1 Heavy Melt, Chicago	34.00	35.00	43.00	61.00	42.50
No. 1 Heavy Melt, Valley	33.50	35.50	40.50	66.50	44.00
No. 1 Heavy Melt, Cleve.	30.50	32.50	38.50	65.00	43.00
No. 1 Heavy Melt, Buffalo	36.50	36.50	41.50	57.50	43.00
Rails, Rerolling, Chicago	49.50	52.50	59.50	87.50	52.50
No. 1 Cast, Chicago	35.50	35.50	40.50	50.50	50.00

COKE, Net Ton					
Beehive, Furn., Connlsvl.	$15.25	$15.25	$15.25	$14.50	$14.75
Beehive, Fdry., Connlsvl.	18.25	18.25	18.25	17.50	17.00

Steel Prices

Mill prices as reported to STEEL, Oct. 30, cents per pound except as otherwise noted. *Changes shown in italics.* Code numbers following mill points indicate producing company. Key to producers, page 178; to footnotes, page 180.

SEMIFINISHED

INGOTS, Carbon, Forging (NT)
Munhall,Pa. U5 ....$73.50

INGOTS, Alloy (NT)
Detroit S41 .....$77.00
Farrell,Pa. S3 .....77.00
Lowellville,O. S3 .....77.00
Midland,Pa. C18 .....77.00
Munhall,Pa. U5 .....77.00
Sharon,Pa. S3 .....77.00

BILLETS, BLOOMS & SLABS
Carbon, Rerolling (NT)
Bessemer,Pa. U5 ....$77.50
Bridgeport,Conn. N19 ..80.50
Buffalo R2 .....77.50
Clairton,Pa. U5 .....77.50
Ensley,Ala. T2 .....77.50
Fairfield,Ala. T2 .....77.50
Fontana,Calif. K1 ....88.00
Gary,Ind. U5 .....77.50
Johnstown,Pa. B2 ....77.50
Lackawanna,N.Y. B2..77.50
Munhall,Pa. U5 .....77.50
S.Chicago,Ill. R2, U5..77.50
S.Duquesne,Pa. U5 ....77.50
Sterling,Ill. N15 .....77.50
Youngstown R2 .....77.50

Carbon, Forging (NT)
Bessemer,Pa. U5 ....$96.00
Bridgeport,Conn. N19..101.00
Buffalo R2 .....96.00
Canton,O. R2 .....98.50
Clairton,Pa. U5 .....96.00
Conshohocken,Pa. A3..101.00
Ensley,Ala. T2 .....96.00
Fairfield,Ala. T2 .....96.00
Fontana,Calif. K1 ...105.50
Gary,Ind. U5 .....96.00
Geneva,Utah C11 .....96.00
Houston S5 .....101.00
Johnstown,Pa. B2 ....96.00
Lackawanna,N.Y. B2..96.00
LosAngeles B3 .....105.50
Midland,Pa. C18 .....96.00
Munhall,Pa. U5 .....96.00
Seattle B3 .....109.50
Sharon,Pa. S3 .....96.00
S.Chicago R2,U5,W14..96.00
S.Duquesne,Pa. U5 ...96.00
S.SanFrancisco B3 ...105.50
Warren,O. C17 .....96.00

Alloy, Forging (NT)
Bethlehem,Pa. B2 ..$114.00
Bridgeport,Conn. N19..114.00
Buffalo R2 .....114.00
Canton,O. R2, T7 ....114.00
Conshohocken,Pa. A3..121.00
Detroit S41 .....114.00
Economy,Pa. B14 ....114.00
Farrell,Pa. S3 .....114.00
Fontana,Calif. K1 ....135.00
Gary,Ind. U5 .....114.00
Houston S5 .....119.00
Ind.Harbor,Ind. Y1 ..114.00
Johnstown,Pa. B2 ....114.00
Lackawanna,N.Y. B2..114.00
LosAngeles B3 .....134.00
Lowellville,O. S3 ....114.00
Massillon,O. R2 ....114.00
Midland,Pa. C18 .....114.00
Munhall,Pa. U5 .....114.00
Sharon,Pa. S3 .....114.00
S.Chicago R2,U5,W14..114.00
S.Duquesne,Pa. U5 ...114.00
Struthers,O. Y1 .....114.00
Warren,O. C17 .....114.00

ROUNDS, SEAMLESS TUBE (NT)
Bridgeport,Conn. N19 $122.50
Buffalo R2 .....117.50
Canton,O. R2 .....120.00
Cleveland,O. R2 .....117.50
Gary,Ind. U5 .....117.50
S.Chicago,Ill. R2, W14 117.50
S.Duquesne,Pa. U5 ...117.50
Warren,O. C17 .....117.50

SKELP
Aliquippa,Pa. J5 ....5.075
Munhall,Pa. U5 .....4.875
Warren,O. R2 .....4.875
Youngstown R2, U5 ..4.875

WIRE RODS
AlabamaCity,Ala. R2 ..6.15
Aliquippa,Pa. J5 .....6.15
Alton,Ill. L1 .....6.35
Buffalo W12 .....6.15
Cleveland A7 .....6.15
Donora,Pa. A7 .....6.15
Fairfield,Ala. T2 .....6.15
Houston S5 .....6.40
IndianaHarbor,Ind. Y1..6.15
Johnstown,Pa. B2 .....6.15
Joliet,Ill. A7 .....6.15
KansasCity,Mo. S5 ....6.40
Kokomo,Ind. C16 .....6.25
LosAngeles B3 .....6.95
Minnequa,Colo. C10 ....6.40
Monessen,Pa. P17 .....6.15
N.Tonawanda,N.Y. B11..6.15
Pittsburg,Calif. C11 ....6.95
Portsmouth,O. P12 .....6.15
Roebling,N.J. R5 .....6.25
S.Chicago,Ill. R2 .....6.15
SparrowsPoint,Md. B2 ..6.25
Sterling,Ill. (1) N15 ....6.15
Sterling,Ill. N15 .....6.25
Struthers,O. Y1 .....6.15
Worcester,Mass. A7 ....6.45

STRUCTURALS

Carbon Steel Std. Shapes
Ala.City,Ala. R2 .....5.275
Atlanta A11 .....5.475
Aliquippa,Pa. J5 .....5.275
Bessemer,Ala. T2 .....5.275
Bethlehem,Pa. B2 .....5.325
Birmingham C15 .....5.275
Clairton,Pa. U5 .....5.275
Fairfield,Ala. T2 .....5.275
Fontana,Calif. K1 .....6.075
Gary,Ind. U5 .....5.275
Geneva,Utah C11 .....5.275
Houston S5 .....5.375
Ind.Harbor,Ind. I-2 ...5.275
Johnstown,Pa. B2 .....5.325
Joliet,Ill. P22 .....5.275
KansasCity,Mo. S5 .....5.375
Lackawanna,N.Y. B2..5.325
LosAngeles B3 .....5.975
Minnequa,Colo. C10 ...5.575
Munhall,Pa. U5 .....5.275
Niles,Calif. P1 .....5.925
Phoenixville,Pa. P4 ..5.325
Portland,Oreg. O4 .....6.025
Seattle B3 .....6.025
S.Chicago,Ill. U5, W14..5.275
S.SanFrancisco B3 .....5.925
Sterling,Ill. N15 .....5.275
Torrance,Calif. C11 ..5.975
Weirton,W.Va. W6 .....5.275

Wide Flange
Bethlehem,Pa. B2 .....5.325
Clairton,Pa. U5 .....5.275
Fontana,Calif. K1 .....6.225
IndianaHarbor,Ind. I-2..5.525
Lackawanna,N.Y. B2..5.325
Munhall,Pa. U5 .....5.275
Phoenixville,Pa. P4 ..5.325
S.Chicago,Ill. U5 .....5.275

Alloy Std. Shapes
Aliquippa,Pa. J5 .....6.55
Clairton,Pa. U5 .....6.55
Gary,Ind. U5 .....6.55
Houston S5 .....6.65
KansasCity,Mo. S5 .....6.65
Munhall,Pa. U5 .....6.55
S.Chicago,Ill. U5 .....6.55

H.S., L.A. Std. Shapes
Aliquippa,Pa. J5 .....7.75
Bessemer,Ala. T2 .....7.75
Bethlehem,Pa. B2 .....7.80
Clairton,Pa. U5 .....7.75
Fairfield,Ala. T2 .....7.75
Fontana,Calif. K1 .....8.55
Gary,Ind. U5 .....7.75
Geneva,Utah C11 .....7.75
Houston S5 .....7.85
Ind.Harbor,Ind. I-2, Y1 7.75
Johnstown,Pa. B2 .....7.80
KansasCity,Mo. S5 .....7.85
Lackawanna,N.Y. B2 ..7.80
LosAngeles B3 .....8.45
Munhall,Pa. U5 .....7.75
Seattle B3 .....8.50
S.Chicago,Ill. U5, W14..7.75
S.SanFrancisco B3 .....8.40
Struthers,O. Y1 .....7.75

H.S., L.A. Wide Flange
Bethlehem,Pa. B2 .....7.80
Lackawanna,N.Y. B2 ..7.80
Munhall,Pa. U5 .....7.75
S.Chicago,Ill. U5 .....7.75

PILING

BEARING PILES
Bethlehem,Pa. B2 .....5.325
Lackawanna,N.Y. B2..5.325
Munhall,Pa. U5 .....5.275
S.Chicago,Ill. U5 .....5.275

STEEL SHEET PILING
Lackawanna,N.Y. B2 ..6.225
Munhall,Pa. U5 .....6.225
S.Chicago,Ill. U5 .....6.225

PLATES

PLATES, Carbon Steel
Ala.City,Ala. R2 .....5.10
Aliquippa,Pa. J5 .....5.10
Ashland,Ky. (15) A10 ..5.10
Bessemer,Ala. T2 .....5.10
Clairton,Pa. U5 .....5.10
Claymount,Del. C22 .....5.10
Cleveland J5, R2 ..... 5.20
Coatesville,Pa. L7 .....5.10
Conshohocken,Pa. A3 ..5.20
Ecorse,Mich. G5 .....5.20
Fairfield,Ala. T2 .....5.10
Fontana,Calif.(30) K1 ..5.90
Gary,Ind. U5 .....5.10
Geneva,Utah C11 .....5.10
GraniteCity,Ill. G4 .....5.30
Harrisburg,Pa. P4 .....5.80
Houston S5 .....5.20
Ind.Harbor,Ind. I-2, Y1..5.10
Johnstown,Pa. B2 .....5.10
Lackawanna,N.Y. B2 ..5.10
LoneStar,Tex. L6 .....5.45
Mansfield,O. E6 .....5.10
Minnequa,Colo. C10 ....5.95
Munhall,Pa. U5 .....5.10
Newport,Ky. A2 .....5.10
Pittsburgh J5 .....5.10
Riverdale,Ill. A1 .....5.10
Seattle B3 .....6.00
Sharon,Pa. S3 .....5.10
S.Chicago,Ill. U5, W14 5.10
SparrowsPoint,Md. B2 ..5.10
Sterling,Ill. N15 .....5.10
Steubenville,O. W10 ....5.10
Warren,O. R2 .....5.10
Youngstown R2, U5, Y1..5.10

PLATES, Carbon Abras. Resist.
Claymont, Del. C22 .....6.25
Fontana,Calif. K1 .....7.55
Geneva,Utah C11 .....6.75
Houston S5 .....6.85
Johnstown,Pa. B2 .....6.75
SparrowsPoint,Md. B2 ..6.75

PLATES, Wrought Iron
Economy,Pa. B14 .....13.15

PLATES, H.S., L.A.
Aliquippa,Pa. J5 .....7.625
Bessemer,Ala. T2 .....7.625
Clairton,Pa. U5 .....7.625
Claymont,Del. C22 .....7.625
Cleveland J5, R2 .....7.625
Coatesville,Pa. L7 .....7.925
Conshohocken,Pa. A3 ..7.625
Economy,Pa. B14 .....7.625
Ecorse,Mich. G5 .....7.725
Fairfield,Ala. T2 .....7.625
Farrell,Pa. S3 .....7.625
Fontana,Calif.(30) K1 ..8.425
Gary,Ind. U5 .....7.625
Geneva,Utah C11 .....7.625
Houston S5 .....7.725
Ind.Harbor,Ind. I-2, Y1 7.625
Johnstown,Pa. B2 .....7.625
Munhall,Pa. U5 .....7.625
Pittsburgh J5 .....7.625
Seattle B3 .....8.525
Sharon,Pa. S3 .....7.625
S.Chicago,Ill. U5, W14 7.625
SparrowsPoint,Md. B2..7.625
Warren,O. R2 .....7.625
Youngstown U5 .....7.625

PLATES, ALLOY
Aliquippa,Pa. J5 .....7.20
Claymont,Del. C22 .....7.20
Coatesville,Pa. L7 .....7.20
Economy,Pa. B14 .....7.20
Farrell,Pa. S3 .....7.20
Fontana,Calif.(30) K1 ..8.00
Gary,Ind. U5 .....7.20
Houston S5 .....7.30
Ind.Harbor,Ind. Y1 ....7.20
Johnstown,Pa. B2 .....7.20
Lowellville,O. S3 .....7.20
Munhall,Pa. U5 .....7.20
Newport,Ky. A2 .....7.20
Pittsburgh J5 .....7.20
Seattle B3 .....8.10
Sharon,Pa. S3 .....7.20
S.Chicago,Ill. U5, W14..7.20
SparrowsPoint,Md. B2..7.20
Youngstown Y1 .....7.20

FLOOR PLATES
Cleveland J5 .....6.175
Conshohocken,Pa. A3 ..6.175
Ind.Harbor,Ind. I-2....6.175
Munhall,Pa. U5 .....6.175
S.Chicago,Ill. U5 .....6.175

PLATES, Ingot Iron
Ashland c.l. (15) A10..5.35
Ashland l.c.l. (15) A10..5.85
Cleveland c.l. R2 .....5.85
Warren,O. c.l. R2 .....5.85

BARS

BARS, Hot-Rolled Carbon (Merchant Quality)
Ala.City,Ala.(9) R2 ..5.425
Aliquippa,Pa.(9) J5 ...5.425
Alton,Ill. L1 .....5.625
Atlanta(9) A11 .....5.625
Bessemer,Ala.(9) T2 ..5.425
Birmingham(9) C15 ..5.425
Bridgeport,Conn.(9) N19 5.65
Buffalo(9) R2 .....5.425
Clairton,Pa. (9) U5....5.425
Cleveland(9) R2 .....5.425
Ecorse,Mich.(9) G5....5.525
Emeryville,Calif. J7 ..6.175
Fairfield,Ala.(9) T2 ..5.425
Fairless,Pa. (9) U5....5.575
Fontana,Calif.(9) K1 ..6.125
Gary,Ind.(9) U5 .....5.425
Houston(9) S5 .....5.675
Ind.Harbor(9) I-2, Y1 5.425
Johnstown,Pa.(9) B2 ..5.425
Joliet,Ill. P22 .....5.425
KansasCity,Mo.(9) S5..5.675
Lackawanna(9) B2 ....5.425
LosAngeles(9) B3 ....6.125
Milton,Pa. M18 .....5.575
Minnequa,Colo. C10 ...5.875
Niles,Calif. P1 .....6.125
N.T'wanda,N.Y.(46)B11 5.775
Pittsburg,Calif.(9) C11..6.125
Pittsburgh(9) J5 .....5.425
Portland,Oreg. O4 ....6.175
Seattle B3, N14 .....6.175
S.Ch'c'go(9)R2,U5,W14 5.425
S.Duquesne,Pa.(9) U5..5.425
S.SanFran.,Calif.(9)B3 6.175
Sterling,Ill.(1)(9) N15..5.425
Sterling,Ill.(9) N15 ....5.525
Struthers,O. Y1 .....5.425
Tonawanda,N.Y. B12 ..5.425
Torrance,Calif.(9) C11..6.125
Youngstown(9) R2, U5 5.425

BARS, H.R. Leaded Alloy (Including leaded extra)
Warren,O. C17 .....7.475

BARS, Hot-Rolled Alloy
Aliquippa,Pa. J5 .....6.475
Bethlehem,Pa. B2 .....6.475
Bridgeport,Conn. N19 ..6.55
Buffalo R2 .....6.475
Canton,O. R2, T7 ....6.475
Clairton,Pa. U5 .....6.475
Detroit S41 .....6.475
Economy,Pa. B14 .....6.475
Ecorse,Mich. G5 .....6.575
Fairless,Pa. U5 .....6.625
Farrell,Pa. S3 .....6.475
Fontana,Calif. K1 ....7.525
Gary,Ind. U5 .....6.475
Houston S5 .....6.725
Ind.Harbor,Ind. I-2, Y1 6.475
Johnstown,Pa. B2 .....6.475
KansasCity,Mo. S5 .....6.725
Lackawanna,N.Y. B2 ..6.475
Lowellville,O. S3 .....6.475
LosAngeles B3 .....7.525
Massillon,O. R2 .....6.475
Midland,Pa. C18 .....6.475
Pittsburgh J5 .....6.475
Sharon,Pa. S3 .....6.475
S.Chicago R2, U5, W14 6.475
S. Duquesne,Pa. U5....6.475
Struthers,O. Y1 .....6.475
Warren,O. C17 .....6.475
Youngstown U5 .....6.475

BARS & SMALL SHAPES, H.R. High-Strength, Low-Alloy
Aliquippa,Pa. J5 .....7.925
Bessemer,Ala. T2 .....7.925
Bethlehem,Pa. B2 .....7.925
Bridgeport,Conn. N19 ...7.95
Clairton,Pa. U5 .....7.925
Cleveland R2 .....7.925
Ecorse,Mich. G5 .....8.025
Fairfield,Ala. T2 .....7.925
Fontana,Calif. K1 ....8.625
Gary,Ind. U5 .....7.925
Houston S5 .....8.175
Ind.Harbor,Ind. Y1 ....7.925
Johnstown,Pa. B2 .....7.925
KansasCity,Mo. S5 ....8.175
Lackawanna,N.Y. B2..7.925
LosAngeles B3 .....8.625
Pittsburgh J5 .....7.925
Seattle B3 .....8.675
S.Chicago,Ill. U5, W14 7.925
S.Duquesne,Pa. U5 ....7.925
S.SanFrancisco B3 ...8.675
Struthers,O. Y1 .....7.925
Youngstown U5 .....7.925

BAR SIZE ANGLES; H.R. Carbon
Bethlehem,Pa.(9) B2 ..5.575
Houston(9) S5 .....5.675
KansasCity,Mo.(9) S5..5.675
Lackawanna(9) B2 ....5.425
Sterling,Ill. N15 .....5.525
Sterling,Ill.(1) N15 ...5.425
Tonawanda,N.Y. B12 ..5.425

BAR SIZE ANGLES; S. Shapes
Aliquippa,Pa. J5 .....5.425
Atlanta A11 .....5.625
Joliet,Ill. P22 .....5.425
Niles,Calif. P1 .....6.125
Pittsburgh J5 .....5.425
Portland,Oreg. O4 ....6.175
SanFrancisco S7 .....6.275
Seattle B3 .....6.175

BAR SHAPES, Hot-Rolled Alloy
Aliquippa,Pa. J5 .....6.55
Clairton,Pa. U5 .....6.55
Gary,Ind. U5 .....6.55
Houston S5 .....6.80
KansasCity,Mo. S5 ....6.80
Pittsburgh J5 .....6.55
Youngstown U5 .....6.55

BARS, C.F., Leaded Alloy (Including leaded extra)
Ambridge,Pa. W18 ...9.925
BeaverFalls,Pa. M12 ..9.925
Camden,N.J. P13 ....10.10
Chicago W18 .....9.925
Cleveland C20 .....9.925
Elyria,O. W8 .....9.925
LosAngeles P2, S30
(Grade A) 11.30
(Grade B) 11.80
Monaca,Pa. S17 .....9.925
Newark,N.J. W18 ....10.10
SpringCity,Pa. K3 ....10.10
Warren,O. C17 .....9.925

BARS, Cold-Finished Carbon
Ambridge,Pa. W18 .....7.30
BeaverFalls,Pa. M12,R2 7.30
Birmingham C15 .....7.90
Bridgeport,Conn. N19 ..7.65
Buffalo B5 .....7.35
Camden,N.J. P13 .....7.75
Carnegie,Pa. C12 .....7.30
Chicago W18 .....7.30
Cleveland A7, C20 ....7.30
Detroit B5, P17 .....7.50
Detroit S41 .....7.30
Donora,Pa. A7 .....7.30
Elyria,O. W8 .....7.30
FranklinPark,Ill. N5 ...7.30
Gary,Ind. R2 .....7.30
GreenBay,Wis. F7 .....7.30
Hammond,Ind. J5, L2 ...7.30
Hartford,Conn. R2 .....7.80
Harvey,Ill. B5 .....7.30
LosAngeles (49), S30 ...8.75
LosAngeles P2, R2 ....8.75
Mansfield,Mass. B5 ....7.85
Massillon,O. R2, R8 ....7.30
Midland,Pa. C18 .....7.30
Monaca,Pa. S17 .....7.30
Newark,N.J. W18 .....7.75
NewCastle,Pa.(17) B4 ..7.30
Pittsburgh J5 .....7.30
Plymouth,Mich. P5 ....7.55
Putnam,Conn. W18 ....7.85
Readville,Mass. C14 ...7.85
S.Chicago,Ill. W14 ....7.30
SpringCity,Pa. K3 .....7.75
Struthers,O. Y1 .....7.30
Warren,O. C17 .....7.30
Willimantic,Conn. J5 ..7.80
Waukegan,Ill. A7 .....7.30
Youngstown F3, Y1 ....7.30

BARS, Cold-Finished Carbon (Turned and Ground)
Cumberland,Md.(5) C19 6.55

BARS, Cold-Finished Alloy
Ambridge,Pa. W18 ....8.775
BeaverFalls,Pa.M12,R2 8.775
Bethlehem,Pa. B2 ....8.775
Bridgeport,Conn. N19 ..8.925
Buffalo B5 .....8.775
Camden,N.J. P13 .....8.95
Canton,O. T7 .....8.775
Carnegie,Pa. C12 .....8.775
Chicago W18 .....8.775
Cleveland A7, C20 ....8.775
Detroit B5, P17 .....8.975
Detroit S41 .....8.775
Donora,Pa. A7 .....8.775
Elyria,O. W8 .....8.775
FranklinPark,Ill. N5 ...8.775
Gary,Ind. R2 .....8.775
GreenBay,Wis. F7 .....8.775
Hammond,Ind. J5, L2 ...8.775
Hartford,Conn. R2 .....9.075
Harvey,Ill. B5 .....8.775
Lackawanna,N.Y. B2 ...8.775
LosAngeles P2 .....10.65
LosAngeles S30 .....10.75
Mansfield,Mass. B5 ....9.075
Massillon,O. R2, R8 ....8.775
Midland,Pa. C18 .....8.775
Monaca,Pa. S17 .....8.775
Newark,N.J. W18 .....8.95
Plymouth,Mich. P5 ....8.975
S.Chicago W14 .....8.775
SpringCity,Pa. K3 .....8.95
Struthers,O. Y1 .....8.775
Warren,O. C17 .....8.775
Waukegan,Ill. A7 .....8.775
Worcester,Mass. A7 ....9.075
Youngstown F3, Y1 ...8.775

BARS, Reinforcing (To Fabricators)

Ala.City,Ala. R2 ....5.425
Atlanta A11 .....5.625
Birmingham C15, S42 5.425
Bridgeport,Conn. N19 ...5.65
Buffalo R2 .....5.425
Cleveland R2 .....5.425
Ecorse,Mich. G5 .....5.775
Emeryville,Calif. J7 ..6.175
Fairfield,Ala. T2 .....5.425
Fairless,Pa. U5 .....5.575
Fontana,Calif. K1 ... 6.125
Ft.Worth,Tex.(4)(26)T4 5.875
Gary, Ind. U5 .....5.425
Houston S5 .....5.675
Ind.Harbor,Ind. I-2,Y1 5.425
Johnstown,Pa. B2 ....5.425
Joliet,Ill. P22 .....5.425
KansasCity,Mo. S5 ....5.675
Lackawanna,N.Y. B2 ..5.425
Los Angeles B3 .....6.125
Milton,Pa. M18 .....5.575
Minnequa,Colo. C10 ...5.875
Niles,Calif. P1 .....6.125
Pittsburg,Calif. C11 ..6.125
Pittsburgh J5 .....5.425
Portland,Oreg. O4 ....6.175
SandSprings,Okla. S5 ..5.925
Seattle B3, N14 .....6.175
S.Chicago,Ill. R2 ....5.425
S.Duquesne,Pa. U5 ....5.425
S.SanFrancisco B3 ....6.175
SparrowsPoint,Md. B2 ..5.425
Sterling,Ill.(1) N15 ...5.425
Sterling. Ill. N15 .....5.525
Struthers,O. Y1 .....5.425
Tonawanda,N.Y. B12 ...6.00
Torrance,Calif. C11 ....6.125
Youngstown R2, U5 ..5.425

BARS, Reinforcing (Fabricated; to Consumers)

Boston B2 .....7.56
Chicago U8 .....6.91
Cleveland U8 .....6.89
Johnstown,Pa. B2 .....7.08
KansasCity,Mo. S5 .....7.35
Lackawanna,N.Y. B2 ..6.85
Marion,O. P11 .....6.70
Newark,N.J. U8 .....7.55
Philadelphia U8 .....7.38
Pittsburgh J5, U8 ....7.10
Seattle B3, N14 .....7.70
SparrowsPt.,Md. B2 ....7.08
St.Paul U8 .....7.92
Williamsport,Pa. S19 ..7.00

BARS, Wrought Iron

Economy,Pa.(S.R.)B14 14.45
Economy,Pa.(D.R.)B14 18.00
Economy,(Staybolt)B14 18.45

RAIL STEEL BARS

ChicagoHts.(3) C2, I-2.5.325
ChicagoHts.(4)(44) I-2.5.425
ChicagoHts.(4) C2 ....5.425
Ft.Worth,Tex.(26) T4..5.875
Franklin,Pa. (3) F5 ..5.325
Franklin,Pa. (4) F5 ...5.425
JerseyShore,Pa.(3) J8 ..5.30
Marion,O.(3) P11 ....5.325
Tonawanda(3) R12 ....5.325
Tonawanda(4) B12 ....6.00
Williamsport,Pa. (3)S19 5.50

SHEETS

SHEETS, Hot-Rolled Steel (18 Gage and Heavier)

Ala.City,Ala. R2 .....4.925
Allenport,Pa. P7 .....4.925
Ashland,Ky.(8) A10 ..4.925
Cleveland J5, R2 ....4.925
Conshohocken,Pa. A3 ..4.975
Detroit(8) M1 .....5.025
Ecorse,Mich. G5 .....5.025
Fairfield,Ala. T2 .....4.925
Fairless,Pa. U5 .....4.975
Fontana,Calif. K1 ....5.825
Gary,Ind. U5 .....4.925
Geneva,Utah C11 .....5.025
GraniteCity,Ill.(8) G4 ..5.125
Ind.Harbor,Ind. I-2, Y1 4.925
Irvin,Pa. U5 .....4.925
Lackawanna,N.Y. B2 ..4.925
Mansfield,O. E6 .....4.925
Munhall,Pa. U5 .....4.925
Newport,Ky.(8) A2 ..4.925
Niles,O. M21, S3 ....4.925
Pittsburg,Calif. C11 ...5.625
Pittsburgh J5 .....4.925
Portsmouth,O. P12 ....4.925
Riverdale,Ill. A1 .....4.925
Sharon,Pa. S3 .....4.925
S.Chicago,Ill. W14 ....4.925
SparrowsPoint,Md. B2..4.925
Steubenville,O. W10 ...4.925
Warren,O. R2 .....4.925
Weirton,W.Va. W6 ....4.925
Youngstown U5, Y1 ..4.925

SHEETS, H.R., (19 Ga. & Lighter)

Niles,O. M21 .....6.05

SHEETS, H.R. Alloy

Gary,Ind. U5 .....8.10
Ind.Harbor,Ind. Y1 ....8.10
Irvin,Pa. U5 .....8.10
Munhall,Pa. U5 .....8.10
Newport,Ky. A2 .....8.10
Youngstown U5, Y1 ....8.10

SHEETS, H.R. (14 Ga. & Heavier) High-Strength, Low-Alloy

Cleveland J5, R2 ....7.275
Conshohocken,Pa. A3 ..7.325
Ecorse,Mich. G5 .....7.375
Fairfield,Ala. T2 .....7.275
Fairless,Pa. U5 .....7.325
Farrel,Pa. S3 .....7.275
Fontana,Calif. K1 ....8.175
Gary,Ind. U5 .....7.275
Ind.Harbor,Ind. I-2, Y1 7.275
Irvin,Pa. U5 .....7.275
Lackawanna (35) B2 ..7.275
Munhall,Pa. U5 .....7.275
Pittsburgh J5 .....7.275
S.Chicago,Ill. U5, W14 7.275
Sharon,Pa. S3 .....7.275
SparrowsPoint(36) B2..7.275
Warren,O. R2 .....7.275
Weirton,W.Va. W6 ....7.275
Youngstown U5, Y1 ..7.275

SHEETS, Hot-Rolled Ingot Iron (18 Gage and Heavier)

Ashland,Ky.(8) A10 ..5.175
Cleveland R2 .....5.675
Warren,O. R2 .....5.675

SHEETS, Cold-Rolled Ingot Iron

Cleveland R2 .....6.80
Middletown,O. A10 ....6.55
Warren,O. R2 .....6.80

SHEETS, Cold-Rolled Steel (Commercial Quality)

AlabamaCity,Ala. R2 ..6.05
Allenport,Pa. P7 .....6.05
Cleveland J5, R2 .....6.05
Conshohocken,Pa. A3 ..6.10
Detroit M1 .....6.05
Ecorse,Mich. G5 .....6.15
Fairfield,Ala. T2 .....6.05
Fairless,Pa. U5 .....6.10
Follansbee,W.Va. F4 ...6.05
Fontana,Calif. K1 ....7.30
Gary,Ind. U5 .....6.05
GraniteCity,Ill. G4 ....6.25
Ind.Harbor,Ind. I-2, Y1 6.05
Irvin,Pa. U5 .....6.05
Lackawanna,N.Y. B2 ..6.05
Mansfield,O. E6 .....6.05
Middletown,O. A10 ....6.05
Newport,Ky. A2 .....6.05
Pittsburg,Calif. C11 ....7.00
Pittsburgh J5 .....6.05
Portsmouth,O. P12 ....6.05
SparrowsPoint,Md. B2 ..6.05
Steubenville,O. W10 ....6.05
Warren,O. R2 .....6.05
Weirton,W.Va. W6 ....6.05
Yorkville,O. W10 .....6.05
Youngstown Y1 .....6.05

SHEETS, Cold-Rolled High-Strength, Low-Alloy

Cleveland J5, R2 ....8.975
Ecorse, Mich. G5 .....9.075
Fairless,Pa. U5 .....9.025
Fontana,Calif. K1 ....10.275
Gary,Ind. U5 .....8.975
IndianaHarbor,Ind. Y1 8.975
Irvin,Pa. U5 .....8.975
Lackawanna (37) B2 ..8.975
Pittsburgh J5 .....8.975
SparrowsPoint (38) B2 8.975
Warren,O. R2 .....8.975
Weirton,W.Va. W6 ....8.975
Youngstown Y1 .....8.975

SHEETS, Culvert

	Cu Steel	Cu Fe
Ashland,Ky. A10	.6.95	7.20
Canton,O. R2	....6.95	7.45
Fairfield T2	.....6.95	7.20
Gary,Ind. U5	.....6.95	7.20
GraniteCity,Ill. G4	7.15	...
Ind.Harbor I-2	...6.95	7.20
Irvin,Pa. U5	.....6.95	7.20
Kokomo,Ind. C16	7.05	...
MartinsFry. W10	.6.95	7.20
Pitts.,Calif. C11	..7.70	...
Pittsburgh J5	....6.95	...
SparrowsPt. B2	..6.95	...

SHEETS, Culvert—Pure Iron

Ind.Harbor,Ind. I-2 .. 7.20

SHEETS, Galvanized Steel Hot-Dipped

Ala.City,Ala. R2 .....6.60‡
Ashland,Ky. A10 .....6.60†
Canton,O. R2 .....6.60‡
Dover,O. R1 .....6.60†
Fairfield,Ala. T2 .....6.60†
Gary,Ind. U5 .....6.60*
GraniteCity,Ill. G4 ....6.80*
Ind.Harbor,Ind. I-2 ....6.60†
Irvin,Pa. U5 .....6.60*
Kokomo,Ind. C16 .....6.70‡
MartinsFerry,O. W10 ..6.60*
Middletown,O. A10 ....6.60†
Pittsburg,Calif. C11 ...7.35*
Pittsburgh J5 .....6.60†
SparrowsPt.,Md. B2 ....6.60†
Warren,O. R2 .....6.60†
Weirton,W.Va. W6 .....6.60*

*Continuous and noncontinuous. †Continuous. ‡Noncontinuous.

SHEETS, Well Casing

Fontana,Calif. K1 ....7.325

SHEETS, Galvanized High-Strength, Low-Alloy

Irvin,Pa. U5 .....9.725
SparrowsPt.(39) B2 ...9.725

SHEETS, Galvannealed Steel

Canton,O. R2 .....7.00
Irvin,Pa. U5 .....7.00

SHEETS, Galvanized Ingot Iron (Hot-Dipped Continuous)

Ashland,Ky. A10 .....6.85
Middletown,O. A10 ....6.85

SHEETS, Electrogalvanized

Cleveland (28) R2 ....7.425
Niles,O. (28) R2 .....7.425
Weirton,W.Va. W6 ...7.275

SHEETS, Aluminum Coated

Butler,Pa. A10 (type 1) .9.25
Butler,Pa. A10 (type 2) .9.35

SHEETS, Enameling Iron

Ashland,Ky. A10 .....6.625
Cleveland R2 .....6.625
Gary,Ind. U5 .....6.625
GraniteCity,Ill. G4 ....6.825
Ind.Harbor,Ind. I-2,Y1 6.625
Irvin,Pa. U5 .....6.625
Middletown,O. A10 ....6.625
Niles,O. M21, S3 .....6.625
Youngstown Y1 .....6.625

BLUED STOCK, 29 Gage

Follansbee,W.Va. F4 ...8.65
Ind.Harbor,Ind. I-2 ...8.475
Yorkville,O. W10 .....8.475

SHEETS, Long Terne Steel (Commercial Quality)

BeechBottom,W.Va.W10 7.00
Gary,Ind. U5 .....7.00
Mansfield,O. E6 .....7.00
Middletown,O. A10 ....7.00
Niles,O. M21, S3 .....7.00
Warren,O. R2 .....7.00
Weirton,W.Va. W6 ....7.00

SHEETS, Long Terne, Ingot Iron

Middeltown,O. A10 .... 7.40

Key to Producers

A1 Acme Steel Co.
A2 Acme-Newport Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A5 Alloy Metal Wire Div., H. K. Porter Co. Inc.
A6 American Shim Steel Co.
A7 American Steel & Wire Div., U. S. Steel Corp.
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.

B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B8 Braeburn Alloy Steel
B9 Brainard Steel Div., Sharon Steel Corp.
B10 E. & G. Brooke, Wickwire Spencer Steel Div., Colo. Fuel & Iron
B11 Buffalo Bolt Co., Div., Buffalo-Eclipse Corp.
B12 Buffalo Steel Corp.
B14 A. M. Byers Co.
B15 J. Bishop & Co.

C1 Calstrip Steel Corp.
C2 Calumet Steel Div., Borg-Warner Corp.
C4 Carpenter Steel Co.
C7 Cleve.Cold Rolling Mills
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft.
C15 Connors Steel Div., H. K. Porter Co. Inc.
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Plant, Wickwire Spencer Steel Div., Colo. Fuel & Iron
C23 Charter Wire Inc.
C24 G. O. Carlson Inc.

D2 Detroit Steel Corp.
D3 Dearborn Div. Sharon Steel Corp.
D4 Disston Div. H. K. Porter Co. Inc.
D6 Driver-Harris Co.
D7 Dickson Weatherproof Nail Co.
D8 Damascus Tube Co.
D9 Wilbur B. Driver Co.

E1 EasternGas&FuelAssoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Corp.

F2 Firth Sterling Inc.
F3 Fitzsimmons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div., Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire
F8 Ft. Wayne Metals Inc.

G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.
G8 Green River Steel Corp.

H1 Hanna Furnace Corp.
H7 Helical Tube Co.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.
I-6 Ivins, E. Steel Tube
I-7 Indiana Steel & Wire Co.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K7 Kenmore Metals Corp.

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L6 Lone Star Steel Co.
L7 Lukens Steel Co.

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M6 Mercer Pipe Div., Sawhill Tubular Products
M8 Mid-States Steel & Wire
M12 Moltrup Steel Products
M14 McInnes Steel Co.
M16 Md.Fine & Special. Wire
M17 Metal Forming Corp.
M18 Milton Steel Div. Merritt-Chapman&Scott
M21 Mallory-Sharon Titanium Corp.
M22 Mill Strip Products Co.

N1 National Standard Co.
N2 National Supply Co.
N3 National Tube Div., U. S. Steel Corp.
N5 Nelson Steel & Wire Co.
N6 New England High Carbon Wire Co.
N8 Newman-Crosby Steel
N9 Newport Steel Corp.
N14 Northwest.SteelRoll.Mill
N15 Northwestern S.&W. Co.
N19 Northeastern Steel Corp.

O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Iron & Steel Co. Sub. of Barium Steel Corp.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke & Chem.
P7 Pittsburgh Steel Co.
P11 Pollak Steel Co.
P12 Portsmouth Div. Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.
P19 Pitts. Rolling Mills
P20 Prod. Steel Strip Corp.
P22 Phoenix Mfg. Co.
P24 Phil. Steel & Wire Corp.

R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R8 Reliance Div.,EatonMfg.
R9 Rome Mfg. Co.
R10 Rodney Metals Inc.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S4 Sharon Tube Co.
S5 Sheffield Steel Div., Armco Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S12 Spencer Wire Corp.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
S20 Southern States Steel
S23 Superior Tube Co.
S25 Stainless Welded Prod.
S26 Specialty Wire Co. Inc.
S30 Sierra Drawn Steel Corp.
S40 Seneca Steel Service
S41 Stainless Steel Div., J&L Steel Corp.
S42 Southern Elec. Steel Co.

T2 Tenn. Coal & Iron Div., U. S. Steel Corp.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Strip Div. Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div., Am. Rad. & Stan. San.
T13 Tube Methods Inc.
T19 Techalloy Co. Inc.

U4 Universal-Cyclops Steel
U5 United States Steel Corp.
U6 U. S. Pipe & Foundry
U7 Ulbrich Stainless Steels
U8 U. S. Steel Supply Div., U. S. Steel Corp.

V2 Vanadium-Alloys Steel
V3 Vulcan Crucible Div., H. K. Porter Co. Inc.

W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W8 Western Automatic Machine Screw Co.
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div., International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.

Y1 Youngstown Sheet&Tube

STRIP

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2	4.925
Allenport,Pa. P7	4.925
Alton,Ill. L1	5.125
Ashland,Ky.(8) A10	4.925
Atlanta A11	5.125
Bessemer,Ala. T2	4.925
Birmingham C15	4.925
Buffalo (27) R2	4.925
Conshohocken,Pa. A3	4.975
Detroit M1	5.025
Ecorse,Mich. G5	5.025
Fairfield,Ala. T2	4.925
Fontana, Calif. K1	5.825
Gary,Ind. U5	4.925
Ind.Harbor,Ind. I-2, Y1	4.925
Johnstown,Pa. (25) B2	4.925
Lackaw'na,N.Y.(25) B2	4.925
LosAngeles(25) B3	5.675
Minnequa, Colo. C10	6.025
Pittsburg,Calif. C11	5.675
Riverdale,Ill. A1	4.925
SanFrancisco S7	6.35
Seattle(25) B3	6.35
Seattle N14	6.35
Sharon,Pa. S3	4.925
S.SanFrancisco(25) B3	5.675
SparrowsPoint,Md. B2	4.925
Sterling,Ill. (1) N15	4.925
Sterling,Ill. N15	5.025
Torrance,Calif. C11	5.675
Warren,O. R2	4.925
Weirton,W.Va. W6	4.925
Youngstown U5	4.925

STRIP, Hot-Rolled Alloy

Carnegie,Pa. S18	8.10
Farrell,Pa. S3	8.10
Gary,Ind. U5	8.10
Houston S5	8.35
Ind.Harbor,Ind. Y1	8.10
KansasCity,Mo. S5	8.35
LosAngeles B3	9.30
Lowellville,O. S3	8.10
Newport,Ky. A2	8.10
Sharon,Pa. S3	8.10
S.Chicago,Ill. W14	8.10
Youngstown U5, Y1	8.10

STRIP, Hot-Rolled High-Strength, Low-Alloy

Bessemer,Ala. T2	7.325
Conshohocken,Pa. A3	7.325
Ecorse,Mich. G5	7.425
Fairfield,Ala. T2	7.325
Farrell,Pa. S3	7.325
Gary,Ind. U5	7.325
Ind.Harbor,Ind. I-2, Y1	7.325
Lackawanna,N.Y. B2	7.325
LosAngeles(25) B3	8.075
Seattle(25) B3	8.325
Sharon,Pa. S3	7.325
S.Chicago,Ill. W14	7.325
S.SanFrancisco(25) B3	8.075
SparrowsPoint,Md. B2	7.325
Warren,O. R2	7.325
Weirton,W.Va. W6	7.325
Youngstown U5, Y1	7.325

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10	5.175
Warren,O. R2	5.675

STRIP, Cold-Rolled Carbon

Anderson,Ind. G6	7.15
Baltimore T6	7.15
Boston T6	7.70
Buffalo S40	7.15
Cleveland A7, J5	7.15
Conshohocken,Pa. A3	7.20
Dearborn,Mich. D3	7.25
Detroit D2, M1, P20	7.25
Dover,O. G6	7.15
Ecorse,Mich. G5	7.25
Evanston,Ill. M22	7.25
Follansbee,W.Va. F4	7.15
Fontana,Calif. K1	9.00
Franklin Park,Ill. T6	7.25
Ind.Harbor,Ind. Y1	7.15
Indianapolis J5	7.30
LosAngeles J5	9.05
LosAngeles C1	9.20
NewBedford,Mass. R10	7.60
NewBritain(10) S15	7.15
NewCastle,Pa. B4, E5	7.15
NewHaven,Conn. D2	7.60
NewKensington,Pa. A6	7.15
Pawtucket,R.I. R3	7.80
Pawtucket,R.I. N8	7.70
Philadelphia(45) P24	7.70
Pittsburgh J5	7.15
Riverdale,Ill. A1	7.25
Rome,N.Y. (32) R6	7.15
Sharon,Pa. S3	7.15
Trenton,N.J. (31) R5	8.60
Wallingford,Conn. W2	7.60
Warren,O. R2, T5	7.15
Weirton,W.Va. W6	7.15
Worcester,Mass. A7	7.70
Youngstown J5, Y1	7.15

STRIP, Cold-Rolled Alloy

Boston T6	15.40
Carnegie,Pa. S18	15.05
Cleveland A7	15.05
Dover,O. G6	15.05
Farrell,Pa. S3	15.05
FranklinPark,Ill. T6	15.05
Harrison,N.J. C18	15.05
Indianapolis J5	15.20
Lowellville,O. S3	15.05
Pawtucket,R.I. N8	15.40
Riverdale,Ill. A1	15.05
Sharon,Pa. S3	15.05
Worcester,Mass. A7	15.35
Youngstown J5	15.05

STRIP, Cold-Rolled High-Strength, Low-Alloy

Cleveland A7	10.45
Dearborn,Mich. D3	10.60
Dover,O. G6	10.45
Ecorse,Mich. G5	10.55
Farrell,Pa. S3	10.50
Ind.Harbor,Ind. Y1	10.65
Sharon,Pa. S3	10.50
Warren,O. R2	10.45

STRIP, Cold-Finished Spring Steel (Annealed)	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Baltimore T6	9.50	10.70	12.90	15.90	18.85
Boston T6	9.50	10.70	12.90	15.90	18.85
Bristol,Conn. W1	...	10.70	12.90	16.10	19.30
Carnegie,Pa. S18	8.95	10.40	12.60	15.60	....
Cleveland A7	8.95	10.40	12.60	15.60	18.55
Dearborn,Mich. D3	9.05	10.50	12.70	....	....
Detroit D2	9.05	10.50	12.70	15.70	....
Dover,O. G6	8.95	10.40	12.60	15.60	18.55
Evanston,Ill. M22	8.95	10.40	12.60	....	....
Fostoria,O. S1	10.05	11.15	13.10	16.10	....
FranklinPark,Ill. T6	9.05	10.40	12.60	15.60	18.55
Harrison,N.J. C18	....	....	12.90	16.10	19.30
Indianapolis J5	9.10	10.55	12.60	15.60	18.55
LosAngeles C1	11.15	12.60	14.80	17.80	....
LosAngeles J5	11.15	12.60	14.80	....	....
NewBritain,Conn.(10) S15	8.95	10.40	12.60	15.60	18.55
NewCastle,Pa. B4, E5	8.95	10.40	12.60	15.60	....
NewHaven,Conn. D2	9.40	10.70	12.90	15.90	....
NewKensington,Pa. A6	8.95	10.40	12.60	15.60	....
NewYork W3	...	10.70	12.90	16.10	19.30
Pawtucket,R.I. N8	9.50	10.70	12.90	15.90	18.85
Riverdale,Ill. A1	9.05	10.40	12.60	15.60	18.55
Rome,N.Y.(32) R6	8.95	10.40	12.60	15.60	18.55
Sharon,Pa. S3	8.95	10.40	12.60	15.60	18.55
Trenton,N.J. R5	...	10.70	12.90	16.10	19.30
Wallingford,Conn. W2	9.40	10.70	12.90	15.90	18.75
Warren,O. T5	8.95	10.40	12.60	15.60	18.55
Worcester,Mass. A7, T6	9.50	10.70	12.90	15.90	18.85
Youngstown J5	8.95	10.40	12.60	15.60	18.55

Spring Steel (Tempered)	Up to 0.80C	0.81-1.05C	1.06-1.35C
Bristol,Conn. W1	18.10	21.95	26.30
Buffalo W12	18.10	....	....
Fostoria,O. S1	18.30	22.15	....
FranklinPark,Ill. T6	18.45	22.30	26.65
Harrison,N.J. C18	18.10	21.95	26.30
NewYork W3	18.10	21.95	26.30
Palmer,Mass. W12	18.10	....	....
Trenton,N.J. R5	18.10	21.95	26.30
Worcester,Mass. A7, T6	18.10	21.95	26.30
Youngstown J5	18.45	22.30	26.65

STRIP, Galvanized (Continuous)

Sharon,Pa. S3	7.275

TIGHT COOPERAGE HOOP

Atlanta A11	5.65
Riverdale,Ill. A1	5.50
Sharon,Pa. S3	5.35
Youngstown U5	5.35

Weirton,W.Va. W6	10.50
Youngstown Y1	10.65

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2	7.90

STRIP, C.R. Electrogalvanized

Cleveland A7	7.15*
Dover,O. G6	7.15*
Evanston,Ill. M22	7.25*
Riverdale,Ill. A1	7.25*
Warren,O. B9, T5	7.15*
Worcester,Mass. A7	7.70*
Youngstown J5	7.15*

*Plus galvanizing extras.

SILICON STEEL

H.R.SHEETS(22 Ga.,cut lengths)	Field	Armature	Electric	Motor	Dynamo
BeechBottom,W.Va. W10	....	....	11.80	12.90	13.95
Mansfield,O. E6	9.625	11.10	11.80	12.90	13.95
Newport,Ky. A2	9.625	11.10	11.80	12.90	13.95
Niles,O. M21, S3	9.625	11.10	11.80	12.90	....
Vandergrift,Pa. U5	....	11.10	11.80	12.90	13.95
Warren,O. R2	9.625	11.10	11.80	12.90	....
Zanesville,O. A10	....	11.10	11.80	12.90	13.95
Zanesville,O. A10 (SP Coils)	....	....	11.55	12.65	13.70

C.R. COILS & CUT LENGTHS (22 Ga.)

Fully Processed (Semiprocessed ½c lower)	Field	Armature	Electric	Motor	Dynamo
BeechBottom,W.Va. W10	....	11.35	12.05	13.15	14.20
Brackenridge,Pa. A4	....	....	12.05	13.15	14.20
GraniteCity,Ill. G4	9.825*	11.05*	11.75*	12.85*	....
IndianaHarbor,Ind. I-2	9.625†	10.85*	11.55*	12.65*	....
Mansfield,O. E6	9.625*	11.35	12.05	13.50	14.20
Vandergrift,Pa. U5	9.625*	11.35	12.05	13.15	14.20
Warren,O. R2	9.625*	11.35	12.05	13.15	14.20
Zanesville,O. A10 (FP Coils)	....	11.35	12.05	13.15	14.20

H.R. SHEETS (22Ga., cut lengths)	Transformer Grades T-72	T-65	T-58	T-52
BeechBottom,W.Va. W10	15.00	15.55	16.05	17.10
Vandergrift,Pa. U5	14.75	15.55	16.05	17.10
Zanesville,O. A10	15.00	15.55	16.05	17.10

C.R. COILS & CUT LENGTHS (22 Ga.)	Grain Oriented T-100	T-90	T-80	T-73	T-66	T-72
Brackenridge,Pa. A4	....	17.60	19.20	19.70	20.20	....
Butler,Pa. A10	....	....	....	19.20	19.70	20.20
Vandergrift,Pa. U5	16.60	17.60	19.20	19.70	20.20	15.25**
Warren,O. R2	....	....	....	....	....	15.25‡

*Semiprocessed. †Fully processed only. ‡Coils, annealed, semiprocessed ½c lower. **Cut lengths, ¾-cent lower.

TIN MILL PRODUCTS

TIN PLATE, Electrolytic (Base Box)	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$8.75	$9.00	$9.40
Fairfield,Ala. T2	8.85	9.10	9.50
Fairless,Pa. U5	8.85	9.10	9.50
Fontana,Calif. K1	9.50	9.75	10.15
Gary,Ind. U5	8.75	9.00	9.40
GraniteCity,Ill. G4	8.85	9.10	9.50
IndianaHarbor,Ind. I-2, Y1	8.75	9.00	9.40
Irvin,Pa. U5	8.75	9.00	9.40
Niles,O. R2	8.75	9.00	9.40
Pittsburg,Calif. C11	9.50	9.75	10.15
SparrowsPoint,Md. B2	8.85	9.10	9.50
Weirton,W.Va. W6	8.75	9.00	9.40
Yorkville,O. W10	8.75	9.00	9.40

ELECTROTIN (22-27 Gage; Dollars per 100 lb)			
Aliquippa,Pa. J5	7.725	7.925	....
Niles,O. R2	7.725	7.925	8.125

TINPLATE, American	1.25 lb	1.50 lb
Aliquippa,Pa. J5	$10.05	$10.30
Fairfield,Ala. T2	10.15	10.40
Fairless,Pa. U5	10.15	10.40
Fontana,Calif. K1	10.80	11.05
Gary,Ind. U5	10.05	10.30
Irvin,Pa. U5	10.05	10.30
Pitts.,Calif. C11	10.80	11.05
Sp.Pt.,Md. B2	10.15	10.40
Weirton,W.Va. W6	10.05	10.30
Yorkville,O. W10	10.05	10.30

BLACK PLATE (Base Box)	
Aliquippa,Pa. J5	$7.85
Fairfield,Ala. T2	7.95
Fairless,Pa. U5	7.95
Fontana,Calif. K1	8.60
Gary,Ind. U5	7.85
GraniteCity,Ill. G4	7.95
Ind.Harbor,Ind. I-2, Y1	7.85
Irvin,Pa. U5	7.85
Niles,O. R2	7.85
Pittsburg,Calif. C11	8.60
SparrowsPoint,Md. B2	7.95
Weirton,W.Va. W6	7.85
Yorkville,O. W10	7.85

HOLLOWARE ENAMELING Black Plate (29 Gage)

Aliquippa,Pa. J5	$7.50
Gary,Ind. U5	7.50
GraniteCity,Ill. G4	7.60
Ind.Harbor,Ind. Y1	7.50
Irvin,Pa. U5	7.50
Yorkville,O. W10	7.50

MANUFACTURING TERNES (Special Coated, Base Box)

Gary,Ind. U5	$9.70
Irvin,Pa. U5	9.70

ROOFING SHORT TERNES (8 lb Coated, Base Box)

Gary,Ind. U5	$11.25

WIRE

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala. R2	7.65
Aliquippa,Pa. J5	7.65
Alton,Ill. L1	7.85
Atlanta A11	7.85
Bartonsville,Ill. K4	7.75
Buffalo W12	7.65
Chicago W13	7.65
Cleveland A7, C20	7.65
Crawfordsville,Ind. M8	7.75
Donora,Pa. A7	7.65
Duluth A7	7.65
Fairfield,Ala. T2	7.65
Fostoria,O.(24) S1	7.75
Houston S5	7.90
Jacksonville,Fla. M8	8.00
Johnstown,Pa. B2	7.65
Joliet,Ill. A7	7.65
KansasCity,Mo. S5	7.90
Kokomo,Ind. C16	7.75
LosAngeles B3	8.60
Minnequa,Colo. C10	7.90
Monessen,Pa. P7, P16	7.65
N.Tonawanda,N.Y. B11	7.65
Palmer,Mass. W12	7.95
Pittsburg,Calif. C11	8.60
Portsmouth,O. P12	7.65
Rankin,Pa. A7	7.65
S.Chicago,Ill. R2	7.65
S.SanFrancisco C10	8.60
SparrowsPoint,Md. B2	7.75
Sterling,Ill.(1) N15	7.65
Sterling,Ill. N15	7.75
Struthers,O. Y1	7.65
Waukegan,Ill. A7	7.65
Worcester,Mass. A7	7.95

WIRE, Gal'd ACSR for Cores

Bartonville,Ill. K4	12.65
Buffalo W12	12.65
Cleveland A7	12.65
Donora,Pa. A7	12.65
Duluth A7	12.65
Johnstown,Pa. B2	12.65
Minnequa,Colo. C10	12.775
Monessen,Pa. P16	12.65
Muncie,Ind. I-7	12.85
New Haven,Conn. A7	12.95
Palmer,Mass. W12	12.95
Pittsburg,Calif. C11	13.45
Portsmouth,O. P12	12.65
Roebling,N.J. R5	12.95
SparrowsPt.,Md. B2	12.75
Struthers,O. Y1	12.65
Trenton,N.J. A7	12.95
Waukegan,Ill. A7	12.65
Worcester,Mass. A7	12.95

WIRE, Upholstery Spring

Aliquippa,Pa. J5	9.30
Alton,Ill. L1	9.50
Buffalo W12	9.30
Cleveland A7	9.30
Donora,Pa. A7	9.30
Duluth A7	9.30
Johnstown,Pa. B2	9.30
KansasCity,Mo. S5	9.55
LosAngeles B3	10.25
Minnequa,Colo. C10	9.50
Monessen,Pa. P7, P16	9.30
NewHaven,Conn. A7	9.60
Palmer,Mass. W12	9.60
Pittsburg,Calif. C11	10.25
Portsmouth,O. P12	9.30
Roebling,N.J. R5	9.60
S.Chicago,Ill. R2	9.30
S.SanFrancisco C10	10.25
SparrowsPt.,Md. B2	9.40
Struthers,O. Y1	9.30
Trenton,N.J. A7	9.60
Waukegan,Ill. A7	9.30
Worcester,Mass. A7	9.60

WIRE, MB Spring, High Carbon

Aliquippa,Pa. J5	9.30
Alton,Ill. L1	9.50
Bartonville,Ill. K4	9.40
Buffalo W12	9.30
Cleveland A7	9.30
Donora,Pa. A7	9.30
Duluth A7	9.30
Fostoria,O. S1	9.35
Johnstown,Pa. B2	9.30
KansasCity,Mo. S5	9.55
LosAngeles B3	10.25
Milbury,Mass.(12) N6	9.60
Minnequa,Colo. C10	9.50
Monessen,Pa. P7, P16	9.30
Muncie,Ind. I-7	9.50
Palmer,Mass.(12) W12	9.60
Pittsburg,Calif. C11	10.25
Portsmouth,O. P12	9.30
Roebling,N.J. R5	9.60
S.Chicago,Ill. R2	9.30
S.SanFrancisco C10	10.25
SparrowsPt.,Md. B2	9.40
Struthers,O. Y1	9.30
Trenton,N.J. A7	9.60
Waukegan,Ill. A7	9.30
Worcester,A7, J4, T6	9.60

WIRE, Fine & Weaving(8" Coils)

Alton,Ill. L1	15.80
Bartonville,Ill. K4	15.70
Buffalo W12	15.60
Chicago W13	15.60
Cleveland A7	15.60
Crawfordsville,Ind. M8	15.70
Fostoria,O. S1	15.60
Houston S5	15.85
Jacksonville,Fla. M8	15.95
Johnstown,Pa. B2	15.60
KansasCity,Mo. S5	15.85
Kokomo,Ind. C16	15.60
Minnequa,Colo. C10	15.85
Monessen,Pa. P7, P16	15.60
Muncie,Ind. I-7	15.80
Palmer,Mass. W12	15.90
S.SanFrancisco C10	16.45
Waukegan,Ill. A7	15.60
Worcester,Mass. A7, T6	15.90

ROPE WIRE

Bartonville,Ill. K4	12.75
Buffalo W12	12.75
Fostoria,O. S1	12.75
Johnstown,Pa. B2	12.75
Monessen,Pa. P7	12.75
Muncie,Ind. I-7	12.95
Palmer,Mass. W12	13.05
Portsmouth,O. P12	12.75
Roebling,N.J. R5	13.05
SparrowsPt.,Md. B2	12.85
Struthers,O. Y1	12.75
Worcester,Mass. J4	13.05

(A) Plow and Mild Plow; add 0.25c for Improved Plow

WIRE, Tire Bead

Bartonville,Ill. K4	16.55
Monessen,Pa. P16	16.55
Roebling,N.J. R5	17.05

WIRE, Cold-Rolled Flat

Anderson,Ind. G6	11.65
Baltimore T6	11.95
Boston T6	11.95
Buffalo W12	11.65
Chicago W13	11.75
Cleveland A7	11.65
Crawfordsville,Ind. MS	11.65
Dover,O. G6	11.65
Fostoria,O. S1	11.95
FranklinPark,Ill. T6	11.75
Kokomo,Ind. C16	11.65
Massillon,O. R8	11.65
Milwaukee C23	11.85
Monessen,Pa. P7, P16	11.65
Palmer,Mass. W12	11.95
Pawtucket,R.I. N8	11.95
Philadelphia P24	11.95
Riverdale,Ill. A1	11.75
Rome,N.Y. R6	11.65
Sharon,Pa. S3	11.65
Trenton,N.J. R5	11.95
Warren,O. B9	11.65
Worcester,Mass. A7, T6	11.95

NAILS, Stock	**Col.**
AlabamaCity,Ala. R2	173
Aliquippa,Pa. J5	173
Atlanta A11	175
Bartonville,Ill. K4	175
Chicago W13	173
Cleveland A9	173
Crawfordsville,Ind. MS	175
Donora,Pa. A7	173
Duluth A7	173
Fairfield,Ala. T2	173
Houston,Tex. S5	178
Jacksonville,Fla.(20) MS	184
Johnstown,Pa. B2	173
Joliet,Ill. A7	173
KansasCity,Mo. S5	178
Kokomo,Ind. C16	175
Minnequa,Colo. C10	178
Monessen,Pa. P7	173
Pittsburg,Calif. C11	192
Rankin,Pa. A7	173
S.Chicago,Ill. R2	173
SparrowsPt.,Md. B2	175
Sterling,Ill.(7) N15	175
Worcester,Mass. A7	179

(To Wholesalers; per cwt)

Galveston,Tex. D7 ... $9.10

NAILS, Cut (100 lb keg) To Dealers (33)	
Conshohocken,Pa. A3	$9.80
Wheeling,W.Va. W10	9.80

POLISHED STAPLES	**Col.**
AlabamaCity,Ala. R2	175
Aliquippa,Pa. J5	175
Atlanta A11	177
Bartonville,Ill. K4	177
Crawfordsville,Ind. MS	177
Donora,Pa. A7	175
Duluth A7	175
Fairfield,Ala. T2	175
Jacksonville,Fla.(20) MS	186
Johnstown,Pa. B2	175
Joliet,Ill. A7	175
Kokomo,Ind. C16	177
Minnequa,Colo. C10	180
Pittsburg,Calif. C11	194
Rankin,Pa. A7	175
S.Chicago,Ill. R2	175
SparrowsPt.,Md. B2	177
Sterling,Ill.(7) N15	175
Worcester,Mass. A7	181

TIE WIRE, Automatic Baler (14½ Ga.)(Per 97 lb Net Box) Coil No. 3150

AlabamaCity,Ala. R2	$10.26
Atlanta A11	10.36
Bartonville,Ill. K4	10.36
Buffalo W12	10.26
Chicago W13	10.26
Crawfordsville,Ind. MS	10.36
Donora,Pa. A7	10.26
Duluth A7	10.26
Fairfield,Ala. T2	10.26
Houston S5	10.51
Jacksonville,Fla. MS	10.82
Johnstown,Pa. B2	10.26
Joliet,Ill. A7	10.26
KansasCity,Mo. S5	10.51
Kokomo,Ind. C16	10.36
LosAngeles B3	11.05
Minnequa,Colo. C10	10.51
Pittsburg,Calif. C11	11.04
S.Chicago,Ill. R2	10.26
S.SanFrancisco C10	11.04
SparrowsPt.,Md. B2	10.36
Sterling,Ill.(3?) N15	10.36

Coil No. 6500 Stand.

AlabamaCity,Ala. R2	$10.60
Atlanta A11	10.70
Bartonville,Ill. K4	10.70
Buffalo W12	10.60
Chicago W13	10.60
Crawfordsville,Ind. MS	10.70
Donora,Pa. A7	10.60
Duluth A7	10.60
Fairfield,Ala. T2	10.60
Houston S5	10.85
Jacksonville,Fla. MS	11.16
Johnstown,Pa. B2	10.60
Joliet,Ill. A7	10.60
KansasCity,Mo. S5	10.85
Kokomo,Ind. C16	10.70
LosAngeles B3	11.40
Minnequa,Colo. C10	10.85
Pittsburg,Calif. C11	11.40
S.Chicago,Ill. R2	10.60
S.San Francisco C10	11.40
SparrowsPt.,Md. B2	10.70
Sterling,Ill.(3?) N15	10.70

Coil No. 6500 Interim

AlabamaCity,Ala. R2	$10.65
Atlanta A11	10.75
Bartonville,Ill. K4	10.75
Buffalo W12	10.65
Chicago W13	10.65
Crawfordsville,Ind. MS	10.75
Donora,Pa. A7	10.65
Duluth A7	10.65
Fairfield,Ala. T2	10.65
Houston S5	10.90
Jacksonville,Fla. MS	11.21
Johnstown,Pa. B2	10.65
Joliet,Ill. A7	10.65
KansasCity,Mo. S5	10.90
Kokomo,Ind. C16	10.75
LosAngeles B3	11.45
Minnequa,Colo. C10	10.90
Pittsburg,Calif. C11	11.45
S.Chicago,Ill. R2	10.65
S.SanFrancisco C10	11.45
SparrowsPt.,Md. B2	10.75
Sterling,Ill.(3?) N15	10.75

BALE TIES, Single Loop	**Col.**
AlabamaCity,Ala. R2	212
Atlanta A11	214
Bartonville,Ill. K4	214
Crawfordsville,Ind. MS	214
Donora,Pa. A7	212
Duluth A7	212
Fairfield,Ala. T2	212
Houston S5	217
Jacksonville,Fla. MS	219
Joliet,Ill. A7	212
KansasCity,Mo. S5	217
Kokomo,Ind. C16	214
Minnequa,Colo. C10	217
Pittsburg,Calif. C11	236
S.SanFrancisco C10	236
SparrowsPt.,Md. B2	214
Sterling,Ill.(7) N15	214
Williamsport,Pa. S19	175

FENCE POSTS

Birmingham C15	171
ChicagoHts.,Ill. C2, I-2	172
Duluth A7	172
Franklin,Pa. F5	172
Huntington,W.Va. C15	171
Johnstown,Pa. B2	172
Marion,O. P11	172
Minnequa,Colo. C10	172
Sterling,Ill.(4) N15	172
Tonawanda,N.Y. B12	174

WIRE, Barbed	**Col.**
AlabamaCity,Ala. R2	193**
Aliquippa,Pa. J5	190§
Atlanta A11	198*
Bartonville,Ill. K4	198
Crawfordsville,Ind. MS	198
Donora,Pa. A7	193
Duluth A7	193
Fairfield,Ala. T2	193
Houston,Tex. S5	198**
Jacksonville,Fla. MS	203
Johnstown,Pa. B2	196§
Joliet,Ill. A7	193
KansasCity,Mo. S5	198**
Kokomo,Ind. C16	195
Minnequa,Colo. C10	198**
Monessen,Pa. P7	196*
Pittsburg,Calif. C11	213
Rankin,Pa. A7	193
S.Chicago,Ill. R2	193**
S.SanFrancisco C10	213**
SparrowsPoint,Md. B2	198§
Sterling,Ill.(7) N15	198§

WOVEN FENCE, 9-15 Ga.	**Col.**
Ala.City,Ala. R2	187*
Aliq'ppa,Pa.9-14½ga.J5	190§
Atlanta A11	192*
Bartonville,Ill. K4	192
Crawfordsville,Ind. MS	192
Donora,Pa. A7	187§
Duluth A7	187§
Fairfield,Ala. T2	187§
Houston,Tex. S5	192**
Jacksonville,Fla. MS	197
Johnstown,Pa.(43) B2	190§
Joliet,Ill. A7	187§
KansasCity,Mo. S5	192**
Kokomo,Ind. C16	189§
Minnequa,Colo. C10	192**
Pittsburg,Calif. C11	210†
Rankin,Pa. A7	187†
S.Chicago,Ill. R2	187**
Sterling,Ill.(7) N15	192§

WIRE (16 gage)	**An'ld Stone**	**Galv. Stone**
Ala.City,Ala.R2	17.15	18.70**
Aliq'ppa,Pa. J5	17.15	18.95
Bartonville K4	17.25	19.05
Cleveland A7	17.15	....
Crawf'dsville MS	17.25	19.05
Fostoria,O. S1	17.65	19.20
Houston S5	17.40	18.95**
Jacksonville MS	17.50	19.30
Johnstown B2	17.15	18.95§
Kan.City,Mo. S5	17.40	....
Kokomo C16	17.25	18.80
Minnequa C10	17.40	18.95**
P'lm'r,Mass.W12	17.45	19.00
Pitts.,Calif. C11	17.50	19.05
SparrowsPt. B2	17.25	19.05§
Sterling(3?) N15	17.25	19.05§
Waukegan A7	17.15	18.70
Worcester A7	17.45	....

WIRE, Merchant Quality (6 to 8 gage)	**An'ld Galv.**
Ala.City,Ala. R2	8.65 9.20**
Aliquippa J5	8.65 9.325§
Atlanta(48) A11	8.75 9.425*
Bartonville(48) K4	8.75 9.425
Buffalo W12	8.65 9.20
Cleveland A7	8.65 ....
Crawfordsville MS	8.75 9.425
Donora,Pa. A7	8.65 9.20
Duluth A7	8.65 9.20
Fairfield T2	8.65 9.20
Houston(48) S5	8.90 9.45**
Jacks'ville,Fla. MS	9.00 9.675
Johnstown B2(48)	8.65 9.325§
Joliet,Ill. A7	8.65 9.20
Kans.City(48) S5	8.90 9.45**
Kokomo C16	8.75 9.30
LosAngeles B3	9.60 10.275§
Minnequa C10	8.90 9.45**
Monessen P7(48)	8.65 9.25*
Palmer,Mass. W12	8.95 9.50
Pitts.,Calif. C11	9.60 10.15
Rankin,Pa. A7	8.65 9.20
S.Chicago R2	8.65 9.20**
S.SanFran. C10	9.60 10.15**
Spar'wsPt.B2(48)	8.75 9.425§
Sterling(48) N15	8.90 9.575§
Sterling(1)(48)	8.80 9.475§
Struth'rs,O.(48) Y1	8.65 9.30†
Worcester,Mass.A7	8.95 9.50

Based on zinc price of: *13.50c. †5c. §10c. ‡Less than 10c. ¶10.50c. **Subject to zinc equalization extras.

FASTENERS

(Base discounts, full container quantity, per cent off list, f.o.b. mill)

BOLTS

Carriage, Machine Bolts

Full Size Body (cut thread)

½ in. and smaller:	
6 in. and shorter	49.0
Longer than 6 in.	39.0
⅝ in. thru 1 in.:	
6 in. and shorter	39.0
Longer than 6 in.	35.0
1¼ in. and larger:	
All lengths	35.0

Undersized Body (rolled thread):

½ in. and smaller:	
6 in. and shorter	49.0

Carriage, Machine, Lag Bolts Hot Galvanized:

½ in. and smaller:	
6 in. and shorter	29.0
Longer than 6 in.	15.0
⅝ in. and larger:	
All lengths	12.0

Lag Bolts (all diam.)

6 in. and shorter	49.0
Longer than 6 in.	39.0

Plow and Tap Bolts

½ in. and smaller by 6 in. and shorter	49.0
Larger than ½ in. or longer than 6 in.	39.0

Blank Bolts ... 39.0

Step, Elevator, Tire Bolts 49.0

Stove Bolts, Slotted:

⅛ to 5/16-in. incl., 3 in. and shorter	55.0
⅜ to ½ in., inclusive	55.0

NUTS

Reg. & Heavy Square Nuts:

All sizes ... 55.5

Square Nuts, Reg. & Heavy, Hot Galvanized:

All sizes ... 41.0

Hex Nuts, Reg. & Heavy, Hot Pressed:

⅛ in. and smaller	60.5
⅞ in. to 1 in., incl.	55.5
1⅛ in. to 1½ in., incl.	58.5
1⅝ in. and larger	53.5

Hex Nuts, Reg. & Heavy, Cold Punched:

⅜ in. and smaller	60.5
⅞ in. to 1½ in., incl.	55.5
1⅝ in. and larger	53.5

Hex Nuts, All Types, Hot Galvanized:

⅛ in. and smaller	46.5
⅞ in. to 1 in., incl.	41.5
1⅛ in. to 1½ in., incl.	46.5

Hex Nuts, Semifinished, Heavy (Incl. Slotted):

⅜ in. and smaller	60.5
⅞ in. to 1½ in., incl.	55.5
1⅝ in. and larger	53.5

Hex Nuts, Finished (Incl. Slotted and Castellated):

1 in. and smaller	63.0
1⅛ in. to 1½ in., incl.	59.0
1⅝ in. and larger	53.5

Semifinished Hex Nuts, Reg. (Incl. Slotted):

⅝ in. and smaller	60.5
¾ in. to 1 in., incl.	63.0
1⅛ in. to 1½ in., incl.	59.0
1⅝ in. and larger	53.5

CAP AND SETSCREWS

(Base discounts, packages, per cent off list, f.o.b. mill)

Hex Head Capscrews, Coarse or Fine Thread, Bright:

6 in. and shorter:

⅝ in. and smaller	40.0
¾, ⅞, and 1 in. diam.	22.0
Longer than 6 in.:	
⅝ in. and smaller	8.0
¾, ⅞, and 1 in. diam.	+ 6.0

High Carbon, Heat Treated:

6 in. and shorter:

⅝ in. and smaller	26.0
¾, ⅞, and 1 in. diam.	3.0

Longer than 6 in.:

⅝ in. and smaller	+ 13.0
¾, ⅞, and 1 in. diam.	+ 32.0

Flat Head Capscrews:

¾ in. and smaller ... + 76.0

Setscrews, Square Head, Cup Point, Coarse Thread:

Through 1 in. diam.:

6 in. and shorter	Net
Longer than 6 in.	+ 23

RIVETS

F.o.b. Cleveland and/or freight equalized with Pittsburgh, f.o.b. Chicago and/or freight equalized with Birmingham except where equalization is too great.

Structural ½ in., larger 12.25
7/16 in. under: List less 19%

BOILER TUBES

Net base c.l. prices, dollars per 100 ft. mill; minimum wall thickness, cut lengths 10 to 24 ft. inclusive.

O.D. In.	B.W. Gage	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
1	13	....	25.98	23.54
1¼	13	....	30.78	23.36
1½	13	29.03	34.01	25.83
1¾	13	34.29	40.18	30.51
2	13	38.44	45.65	34.20
2¼	13	43.29	50.75	38.52
2¼	12	46.99	55.06	41.81
2½	12	51.76	60.65	46.05
2¾	12	56.04	65.67	49.88
3	12	59.76	70.03	53.19

RAILWAY MATERIALS

	Standard No. 1	Standard No. 2	Tee Rails All	Tee Rails 60 lb Under
RAILS				
Bessemer,Pa. U5	5.525	5.425	....	6.50
Ensley,Ala. T2	5.525	5.425	....	6.50
Fairfield,Ala. T2	....	....	....	6.50
Gary,Ind. U5	5.525	5.425	....	....
Huntington,W.Va. C15	....	....	....	6.50
IndianaHarbor,Ind. I-2	5.525	5.425	5.475	....
Johnstown,Pa. B2	....	....	....	(16)6.50
Lackawanna,N.Y. B2	5.525	5.425	....	6.50
Minnequa,Colo. C10	5.525	5.425	....	7.00
Steelton,Pa. B2	5.525	5.425	....	....
Williamsport,Pa. S19	....	....	....	6.50

TIE PLATES	
Fairfield,Ala. T2	6.60
Gary,Ind. U5	6.60
Ind.Harbor,Ind. I-2	6.60
Lackawanna,N.Y. B2	6.60
Minnequa,Colo. C10	6.60
Seattle B3	6.75
Steelton,Pa. B2	6.60
Torrance,Calif. C11	6.75

JOINT BARS	
Bessemer,Pa. U5	6.975
Fairfield,Ala. T2	6.975
Ind.Harbor,Ind. I-2	6.975
Joliet,Ill. U5	6.975
Lackawanna,N.Y. B2	6.975
Minnequa,Colo. C10	6.975
Steelton,Pa. B2	6.975

AXLES	
Ind.Harbor,Ind. S13	8.775
Johnstown,Pa. B2	8.775

TRACK BOLTS, Untreated	
Cleveland R2	14.75
KansasCity,Mo. S5	14.75
Lebanon,Pa. B2	14.75
Minnequa,Colo. C10	14.75
Pittsburgh P14	14.75
Seattle B3	15.25

SCREW SPIKES	
Lebanon,Pa. B2	14.50

STANDARD TRACK SPIKES	
Fairfield, Ala. T2	9.75
Ind.Harbor,Ind. I-2, Y1	9.75
KansasCity,Mo. S5	9.75
Lebanon,Pa. B2	9.75
Minnequa,Colo. C10	9.75
Pittsburgh J5	9.75
Seattle B3	10.25
S.Chicago,Ill. R2	9.75
Struthers,O. Y1	9.75
Youngstown R2	9.75

Footnotes

(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(5) 1¼ to under 1 7/16 in.; 1 7/16 to under 1 15/16 in., 6.70c; 1 15/16 to 8 in., inclusive, 7.05c.
(6) Chicago or Birm. base.
(7) Chicago base 2 cols. lower.
(8) 13 Ga. and heavier.
(9) Merchant quality; add 0.35c for special quality.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass., base.
(13) Add 0.25c for 17 Ga. & heavier.
(14) Gage 0.143 to 0.249 in.; for gage 0.142 and lighter, 5.80c.
(15) ⅜" and thinner.
(16) 40 lb and under.
(17) Flats only; 0.25 in. & heavier.
(18) To dealers.
(19) Chicago & Pitts. base.
(20) Plus 1c per 100 lb.
(21) New Haven, Conn. base.
(22) Deld. San Francisco Bay area.
(23) Special quality.
(24) Deduct 0.15c, finer than 15 Ga.
(25) Bar mill bands.
(26) Delivered in mill zone, 6.045c.
(27) Bar mill sizes.
(28) Bonderized.
(29) Youngstown base.
(30) Sheared; for universal mill add 0.45c.
(31) Widths over ⅝ in.; 7.60c, for widths ⅝ in. and under by 0.125 in. and thinner.
(32) Buffalo base.
(33) To jobbers, deduct 20c.
(34) 9.60c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) Chicago base, 10 points lower.
(38) 14 Ga. & lighter; 48" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.025"; 0.025" and heavier, 0.25c higher.
(41) 9.10c for cut lengths.
(42) Mill lengths, f.o.b. mill; deld. in mill zone or within switching limits, 5.685c.
(43) 9-14½ Ga.
(44) To fabricators.
(45) 0.022 in. and lighter, over 0.022", 8.20c.
(46) Special quality.
(48) 6-7 Ga.
(49) 3½ in. and smaller rounds; 9.30c, over 3½ in. and other shapes.

SEAMLESS STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	2		2½		3		3½		4		5		6	
List Per Ft	37c		58.5c		76.5c		92c		$1.09		$1.48		$1.92	
Pounds Per Ft	3.68		5.82		7.62		9.20		10.89		14.81		19.18	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	+9.25	+24.25	+2.75	+19.5	+0.25	+17	1.25	+15.5	1.25	+15.5	1	+15.75	3.5	+13.25
Ambridge, Pa. N2	+9.25	....	+2.75	....	+0.25	....	1.25	....	1.25	....	1	....	3.5	....
Lorain, O. N3	+9.25	+24.25	+2.75	+19.5	+0.25	+17	1.25	+15.5	1.25	+15.5	1	+15.75	3.5	+13.25
Youngstown Y1	+9.25	+24.25	+2.75	+19.5	+0.25	+17	1.25	+15.5	1.25	+15.5	1	+15.75	3.5	+13.25

ELECTRIC STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Youngstown R2	+9.25	+24.25	+2.75	+19.5	+0.25	+17	1.25	+15.5	1.25	+15.5	1	+15.75	3.5	+13.25

BUTTWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	⅛		¼		⅜		½		¾		1		1¼	
List Per Ft	5.5c		6c		6c		8.5c		11.5c		17c		23c	
Pounds Per Ft	0.24		0.42		0.57		0.85		1.13		1.68		2.28	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	....	....	....	....	....	....	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75
Alton, Ill. L1	....	....	....	....	....	....	3.25	+12	6.25	+8	9.75	+3.5	12.25	+2.75
Benwood, W. Va. W10	4.5	+22	+7.5	+31	+18	+39.5	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75
Butler, Pa. F6	5.5	+21	+6.5	+30	+17	+38.5	....	....	....	....	....	....	....	....
Etna, Pa. N2	....	....	....	....	....	....	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75
Fairless, Pa. N3	....	....	....	....	....	....	3.25	+12	6.25	+8	9.75	+3.5	12.25	+2.75
Fontana, Calif. K1	....	....	....	....	....	....	+8.25	+23.5	+5.25	+19.5	+1.75	+15	0.75	+14.25
Indiana Harbor, Ind. Y1	....	....	....	....	....	....	4.25	+11	7.25	+7	10.75	+2.5	13.25	+3.25
Lorain, O. N3	....	....	....	....	....	....	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75
Sharon, Pa. S4	5.5	+21	+6.5	+30	+17	+38.5	....	....	....	....	....	....	....	....
Sharon, Pa. M6	....	....	....	....	....	....	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75
Sparrows Pt., Md. B2	3.5	+23	8.5	+32	+19	+40.5	3.25	+12	6.25	+8	9.75	+3.5	12.25	+2.75
Wheatland, Pa. W9	5.5	+21	+6	+30	+17	+38.5	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75
Youngstown R2, Y1	....	....	....	....	....	....	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75

Size—Inches	1½		2		2½		3		3½		4	
List Per Ft	27.5c		37c		58.5c		76.5c		92c		$1.09	
Pounds Per Ft	2.73		3.68		5.82		7.62		9.20		10.89	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	....	....	....	....
Alton, Ill. L1	12.75	+1.75	13.25	+1.25	14.75	+1.5	14.75	+1.5	....	....	....	....
Benwood, W. Va. W10	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	6.25	+10.5	6.25	+10.5
Etna, Pa. N2	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	6.25	+10.5	6.25	+10.5
Fairless, Pa. N3	12.75	+1.75	13.25	+1.25	14.75	+1.5	14.75	+1.5	4.25	+12.5	4.25	+12.5
Fontana, Calif. K1	1.25	+13.25	1.75	+12.75	3.25	+13	3.25	+13	+7.25	+24	+7.25	+24
Indiana Harbor, Ind. Y1	13.75	+0.75	14.25	+0.25	15.75	+0.5	15.25	+0.5	5.25	+11.5	5.25	+11.5
Lorain, O. N3	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	....	....	....	....
Sharon, Pa. M6	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	....	....	....	....
Sparrows Pt., Md. B2	12.75	+1.75	13.25	+1.25	14.75	+1.5	14.75	+1.5	4.25	+12.5	4.25	+12.5
Wheatland, Pa. W9	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	6.25	+10.5	6.25	+10.5
Youngstown R2, Y1	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	6.25	+10.5	6.25	+10.5

*Galvanized pipe discounts based on current price of zinc (10.00c, East St. Louis).

Stainless Steel

Representative prices, cents per pound; subject to current lists of extras

AISI Type	—Rerolling— Ingot	Slabs	Forging Billets	H.R. Strip	Wire Rods; C.F. Wire	Bars; Structural Shapes	Plates	Sheets	C.R. Strip; Flat Wire
201	22.00	27.00	....	36.00	....	42.00	44.25	48.50	45.00
202	23.75	30.25	36.50	39.00	40.75	43.00	45.00	49.25	49.25
301	23.25	28.00	37.25	37.25	42.00	44.25	46.25	51.25	47.50
302	25.25	31.50	38.00	40.50	42.75	45.00	47.25	52.00	52.00
302B	25.50	32.75	40.75	45.75	45.00	47.25	49.50	57.00	57.00
303	....	32.00	41.00	....	45.50	48.00	50.00	56.75	56.75
304	27.00	33.25	40.50	44.25	45.25	47.75	50.75	55.50	55.50
304L	....	....	48.25	51.50	53.00	55.50	58.50	63.25	63.25
305	28.50	36.75	42.50	47.50	45.25	47.75	51.25	58.75	58.75
308	30.75	38.25	47.25	50.25	52.75	55.75	60.25	63.00	63.00
309	39.75	49.50	57.75	64.50	63.75	67.00	71.00	80.50	80.50
310	49.75	61.50	78.00	84.25	86.50	91.00	92.75	96.75	96.75
314	....	....	....	....	86.50	....	92.75	....	104.50
316	39.75	49.50	62.25	69.25	69.25	73.00	76.75	81.50	81.50
316L	....	....	70.00	76.50	77.00	80.75	84.50	89.25	89.25
317	48.00	60.00	76.75	88.25	86.25	90.75	93.50	101.00	101.00
321	32.25	40.00	47.00	53.50	52.50	55.50	59.75	65.50	65.50
330	....	....	....	106.75	....	106.75	106.75	105.50	108.00	149.25
18-8 CbTa	37.00	46.50	55.75	63.50	61.50	64.75	69.75	79.25	79.25
403	....	....	32.00	....	35.75	37.75	40.25	48.25	48.25
405	19.50	25.50	29.75	36.00	33.50	35.25	37.50	46.75	46.75
410	16.75	21.50	28.25	31.00	32.00	33.75	35.00	40.25	40.25
416	....	....	28.75	....	32.50	34.25	36.25	48.25	48.25
420	....	33.50	34.25	41.75	39.25	41.25	45.25	62.00	62.00
430	17.00	21.75	28.75	32.00	32.50	34.25	36.00	40.75	40.75
430F	....	....	29.50	....	33.00	34.75	36.75	51.75	51.75
431	....	28.75	37.75	....	42.00	44.25	46.00	56.00	56.00
446	....	....	39.25	59.00	44.25	46.50	47.75	70.00	70.00

Stainless Steel Producers Are: Allegheny Ludlum Steel Corp.; American Steel & Wire Div., U. S. Steel Corp.; Anchor Drawn Steel Co., division of Vanadium-Alloys Steel Co.; Armco Steel Corp.; Babcock & Wilcox Co.; Bethlehem Steel Co.; J. Bishop & Co.; A. M. Byers Co.; G. O. Carlson Inc.; Carpenter Steel Co.; Charter Wire Products; Crucible Steel Co. of America; Damascus Tube Co.; Dearborn Div., Sharon Steel Corp.; Wilbur B. Driver Co.; Driver-Harris Co.; Eastern Stainless Steel Corp.; Firth Sterling Inc.; Fort Wayne Metals Inc.; Green River Steel Corp., subsidiary of Jessop Steel Co.; Indiana Steel & Wire Co.; Ingersoll Steel Div., Borg-Warner Corp.; Ellwood Ivins Steel Tube Works Inc.; Jessop Steel Co.; Johnson Steel & Wire Co. Inc.; Jones & Laughlin Steel Corp.; Joslyn Stainless Steels, division of Joslyn Mfg. & Supply Co.; Latrobe Steel Co.; Lukens Steel Co.; Maryland Fine & Specialty Wire Co. Inc.; McInnes Steel Co.; McLouth Steel Corp.; Metal Forming Corp.; Midvale-Heppenstall Co.; National Standard Co.; National Tube Div., U. S. Steel Corp.; Pacific Tube Co.; Page Steel & Wire Div., American Chain & Cable Co. Inc.; Pittsburgh Rolling Mills Inc.; Republic Steel Corp.; Riverside-Alloy Metal Div., H. K. Porter Company Inc.; Rodney Metals Inc.; Sawhill Tubular Products Inc.; Sharon Steel Corp.; Simonds Saw & Steel Co.; Specialty Wire Co. Inc.; Standard Tube Co.; Superior Steel Corp.; Superior Tube Co.; Swepco Tube Corp.; Techalloy Co. Inc.; Timken Roller Bearing Co.; Trent Tube Co., subsidiary of Crucible Steel Co. of America; Tube Methods Inc.; Ulbrich Stainless Steels Inc.; U. S. Steel Corp.; Universal-Cyclops Steel Corp.; Vanadium-Alloys Steel Co.; Wall Tube & Metal Products Co.; Wallingford Steel Co., subsidiary of Allegheny Ludlum Steel Corp.; Washington Steel Corp.

Clad Steel

	Plates 5%	Plates Carbon Base 10%	Plates Carbon Base 15%	Plates Carbon Base 20%	Sheets Carbon Base 20%
Stainless					
302	....	....	....	....	37.50
304	34.70	37.95	42.25	46.70	40.00
304L	36.90	40.55	45.10	49.85	....
316	40.35	44.40	49.50	54.50	58.75
316L	45.05	49.35	54.70	60.10	....
316 Cb	47.30	53.80	61.45	69.10	....
321	36.60	40.05	44.60	49.30	47.25
347	38.25	42.40	47.55	52.80	57.00
405	28.60	29.85	33.35	36.85	....
410	28.15	29.55	33.10	36.70	....
430	28.30	29.80	33.55	37.25	....
Inconel	48.90	59.55	70.15	80.85	....
Nickel	41.65	51.95	62.30	72.70	....
Nickel, Low Carbon	41.95	52.60	63.30	74.15	....
Monel	43.35	53.55	63.80	74.05	....
Copper*	....	....	....	....	46.00

	Strip, Carbon Base —Cold Rolled— 10%	Both Sides
Copper*	33.95	40.25

*Deoxidized. Production points: Stainless-clad sheets, New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7, New Castle, Ind. I-4, and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; copper-clad strip, Carnegie, Pa. S18.

Tool Steel

Grade	$ per lb	Grade	$ per lb
Regular Carbon	0.305	Cr Hot Work	0.510
Extra Carbon	0.360	W-Cr Hot Work	0.500
Special Carbon	0.475	V-Cr Hot Work	0.475
Oil Hardening	0.475	Hi-Carbon-Cr	0.830

Grade by Analysis (%) W	Cr	V	Co	Mo		$ per lb
20.25	4.25	1.6	12.25	....	....	4.285
18.25	4.25	1	4.75	....	....	2.500
18	4	2	9	....	....	2.870
18	4	2	....	....	....	1.960
18	4	1	....	....	....	1.795
9	3.5	..	....	....	....	1.395
13.5	4	3	....	....	....	2.060
13.75	3.75	2	5	....	....	2.440
6.4	4.5	1.9	....	5	....	1.300
6	4	3	....	6	....	1.545
1.5	4	1	....	8.5	....	1.155

Tool steel producers include: A4, A8, B2, B8, C4, C9, C13, C18, F2, J3, L3, M14, S8, U4, V2, and V3.

Pig Iron

F.o.b. furnace prices in dollars per gross ton, as reported to STEEL. Minimum delivered prices are approximate and do not include 3% federal transportation tax.

	Basic	No. 2 Foundry	Malle-able	Besse-mer
Birmingham District				
AlabamaCity,Ala. R2	62.00	62.50	....	....
Birmingham R2	62.00	62.50‡	....	....
Birmingham U6	....	62.50‡	66.50	....
Woodward,Ala. W15	62.00**	62.50‡	66.50	....
Cincinnati, deld.	....	70.20	....	....
Buffalo District				
Buffalo H1, R2	66.00	66.50	67.00	67.50
N.Tonawanda,N.Y. T9	....	66.50	67.00	67.50
Tonawanda,N.Y. W12	66.00	66.50	67.00	67.50
Boston, deld.	77.29	77.79	78.29	....
Rochester,N.Y., deld.	69.02	69.52	70.02	....
Syracuse,N.Y., deld.	70.12	70.62	71.12	....
Chicago District				
Chicago I-3	66.00	66.50	66.50	67.00
S.Chicago,Ill. R2	66.00	....	66.50	....
S.Chicago,Ill. W14	66.00	....	66.50	67.00
Milwaukee, deld.	68.62	69.12	69.12	69.62
Muskegon,Mich., deld.	....	74.12	74.12	....
Cleveland District				
Cleveland R2, A7	66.00	66.50	66.50	67.00
Akron,O., deld.	69.12	69.62	69.62	70.12
Mid-Atlantic District				
Birdsboro,Pa. B10	68.00	68.50	69.00	69.50
Chester,Pa. P4	66.50	67.00	67.50	....
Swedeland,Pa. A3	68.00	68.50	69.00	69.50
New York, deld.	....	75.10	75.60	....
Newark,N.J., deld.	72.29	72.79	73.29	73.79
Philadelphia, deld.	70.01	70.51	71.01	71.59
Troy,N.Y. R2	68.00	68.50	69.00	69.50
Pittsburgh District				
NevilleIsland,Pa. P6	66.00	66.50	66.50	67.00
Pittsburgh (N&S sides), Aliquippa, deld.	....	67.95	67.95	68.48
McKeesRocks,Pa., deld.	....	67.60	67.60	68.13
Lawrenceville,Homestead, Wilmerding,Monaca,Pa., deld.	....	68.26	68.26	68.79
Verona,Trafford,Pa., deld.	68.29	68.82	68.82	69.35
Brackenridge,Pa., deld.	68.60	69.10	69.10	69.63
Midland,Pa. C18	66.00	....	....	....

	Basic	No. 2 Foundry	Malle-able	Besse-mer
Youngstown District				
Hubbard,O. Y1	....	....	66.50	....
Sharpsville,Pa. S6	66.00	....	66.50	67.00
Youngstown Y1	....	....	66.50	67.00
Mansfield,O., deld.	70.90	....	71.40	71.90
Duluth I-3	66.00	66.50	66.50	67.00
Erie,Pa. I-3	66.00	66.50	66.50	67.00
Everett,Mass. E1	67.50	68.00	68.50	....
Fontana,Calif. K1	75.00	75.50	....	....
Geneva,Utah C11	66.00	66.50	....	....
GraniteCity,Ill. G4	67.90	68.40	68.90	....
Ironton,Utah C11	66.00	66.50	....	....
Minnequa,Colo. C10	68.00	68.50	69.00	....
Rockwood,Tenn. T3	....	62.50‡	66.50	....
Toledo,O. I-3	66.00	66.50	66.50	67.00
Cincinnati, deld.	72.54	73.04	....	....

**Phos. 0.70-0.90%; Phos. 0.30-0.69%, $63.
‡Phos. 0.70-0.90%; Phos. 0.30-0.69%, $63.50.

PIG IRON DIFFERENTIALS

Silicon: Add 75 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos. iron on which base is 1.75-2.00%.

Manganese: Add 50 cents per ton for each 0.25% manganese over 1% or portion thereof.

Nickel: Under 0.50% no extra; 0.50-0.74%, inclusive, add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.00-6.50% silicon; add $1 for each 0.50% silicon or portion thereof over the base grade within a range of 6.50 to 11.50%; starting with silicon over 11.50% add $1.50 per ton for each 0.50% silicon or portion thereof up to 14%; add $1 for each 0.50% Mn over 1%)

Jackson,O. I-3, J1	78.00
Buffalo H1	79.25

ELECTRIC FURNACE SILVERY IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1.25 for each 0.50% Mn over 1%; $2 per gross ton premium for 0.045% max P)

CalvertCity,Ky. P15	$99.00
NiagaraFalls,N.Y. P15	99.00
Keokuk,Iowa Open-hearth & Fdry. $9 freight allowed K2	103.50
Keokuk,Iowa O.H. & Fdry, 12½ lb piglets, 16% Si, max fr'gt allowed up to $9, K2	106.50

LOW PHOSPHORUS PIG IRON, Gross Ton

Lyles,Tenn. T3 (Phos. 0.035% max)	$78.50
Troy,N.Y. R2 (Phos. 0.035% max)	74.00
Philadelphia, deld.	82.27
Cleveland A7 (Intermediate) (Phos. 0.036-0.075% max)	71.00
Duluth I-3 (Intermediate) (Phos. 0.036-0.075% max)	71.00
Erie,Pa. I-3 (Intermediate) (Phos. 0.036-0.075% max)	71.00
NevilleIsland,Pa. P6 (Intermediate) (Phos. 0.036-0.075% max)	71.00

Warehouse Steel Products

Representative prices, per pound, subject to extras, f.o.b. warehouse. City delivery charges are 15 cents per 100 lb except: Moline, Norfolk, Richmond, Washington, 20 cents; Baltimore, Boston, Los Angeles, New York, Philadelphia, Portland, Spokane, San Francisco, 10 cents; Atlanta, Chattanooga, Houston, Seattle no charge.

	SHEETS				STRIP	BARS			Standard Structural Shapes	PLATES	
	Hot-Rolled	Cold-Rolled	Gal. 10 Ga.†	Stainless Type 302	Hot-Rolled*	H.R. Rounds	C.F. Rds.‡	H.R. Alloy 4140††§		Carbon	Floor
Atlanta	8.59‖	9.86‖	....	....	8.64	9.01	10.68	....	9.05	8.97	10.90
Baltimore	8.28	8.88	9.76	....	8.76	9.06	11.34#	15.18	9.19	8.66	10.14
Birmingham	8.18	9.45	11.07	....	8.23	8.60	10.57	....	8.64	8.56	10.70
Boston	9.38	10.44	11.45	....	9.42	9.73	12.90#	15.28	9.63	9.72	11.20
Buffalo	8.40	9.00	10.07	....	8.50	8.80	10.90#	15.00	8.90	8.90	10.45
Chattanooga	8.35	9.69	9.65		8.40	8.77	10.46	....	8.88	8.80	10.66
Chicago	8.20	9.45	10.00	53.00	8.23	8.60	8.80	14.65	8.64	8.56	9.88
Cincinnati	8.34	9.48	10.05	52.43	8.54	8.92	9.31	14.96	9.18	8.93	10.21
Cleveland	8.18	9.45	9.95	55.68	8.33	8.69	10.80#	14.74	9.01	8.79	10.11
Denver	9.38	11.75	....	....	9.41	9.78	11.10	....	9.82	9.74	11.06
Detroit	8.43	9.70	10.35	...	8.58	8.90	9.15	14.91	9.18	8.91	10.13
Erie, Pa.	8.20	9.45	9.95[10]	....	8.50	8.75	9.05[10]	....	9.00	8.85	10.10
Houston	8.45	9.75	8.45	....	8.60	9.05	11.10	....	9.10	9.05	10.30
Jackson, Miss.	8.52	9.79	....	....	8.57	8.94	10.68	....	8.97	8.90	10.74
Los Angeles	9.50	10.75	11.65	....	9.55	9.55	12.75	16.00	9.60	9.55	11.70
Milwaukee	8.33	9.58	10.13	....	8.36	8.73	9.03	14.78	8.85	8.69	10.01
Moline, Ill.	8.55	9.80	10.35	....	8.58	8.95	9.15	....	8.99	8.91	....
New York	8.87	10.13	10.56	....	9.31	9.57	12.76#	15.09	9.35	9.43	10.71
Norfolk, Va.	8.05	....	....	....	8.55	8.60	10.80	....	8.95	8.45	9.95
Philadelphia	8.00	8.90	9.87	51.94	8.69	8.65	11.51#	15.01	8.50	8.77	9.77**
Pittsburgh	8.18	9.45	10.35	55.50	8.33	8.60	10.80#	14.65	8.64	8.56	9.88
Portland, Oreg.	8.50	11.20	11.55	57.20	11.35‡‡	8.65	14.65#	15.95	9.60	8.30	12.50
Richmond, Va.	8.45	....	10.40	....	9.15	9.15	....	....	9.40	8.85	10.35
St. Louis	8.54	9.79	10.36	....	8.59	8.97	9.41	15.01	9.10	8.93	10.25
St. Paul	8.79	10.04	10.61	....	8.84	9.36	9.66	....	9.38	9.30	10.49
San Francisco	9.35	10.75	11.00	54.85	9.45	9.70	13.00	16.00	9.50	9.60	12.00
Seattle	9.95	11.15	12.00	57.20	10.00	10.80	14.05	16.35	9.80	9.70	12.10
Spokane, Wash.	9.95	11.15	12.00	....	10.00	10.10	14.05	17.20	9.80	9.70	12.10
Washington	8.48	9.58	....	....	9.06	9.15	9.73	....	9.35	8.86	10.36

*Prices do not include gage extras; †prices include gage and coating extras; ‡includes 35-cent bar quality extras; §42 in. and under; **¼ in. and heavier; ††as annealed; ‡‡over 4 in.; §§over 3 in.; ‖#1 in. round C-1018.

Base quantities, 2000 to 4999 lb except as noted; cold-rolled strip and cold-finished bars, 2000 lb and over except in Seattle, 2000 to 9999 lb, and in Los Angeles, 6000 lb and over; stainless sheets, 8000 lb except in Chicago, New York, Boston, Seattle, Portland, Oreg. 10,000 lb and in San Francisco, 2000 to 4999 lb; hot-rolled products on West Coast, 2000 to 9999 lb, except in Portland, Oreg., 1000 to 9999 lb; [2]—400 to 9999 lb; [8]—1000 to 1999 lb; [8]—2000 to 3999 lb; [10]—2000 lb and over.

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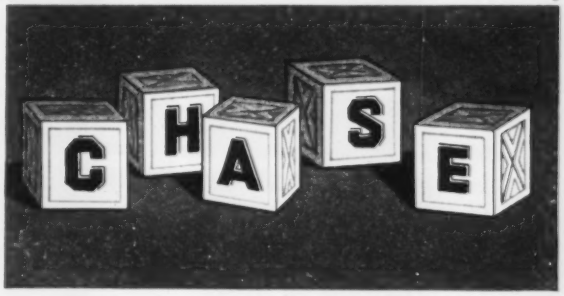

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"C" Steel Castings—sand or shell molded—possess qualities far more interesting than the mere strength of steel. For, in addition to strength they provide more efficient design—better weight-strength ratio—and greater fatigue resistance, i.e., longer life and less replacement. Furthermore "C" Steel Castings, because they are truly foundry engineered from pattern to final casting, require minimum machining and provide better fit plus fast assembly.

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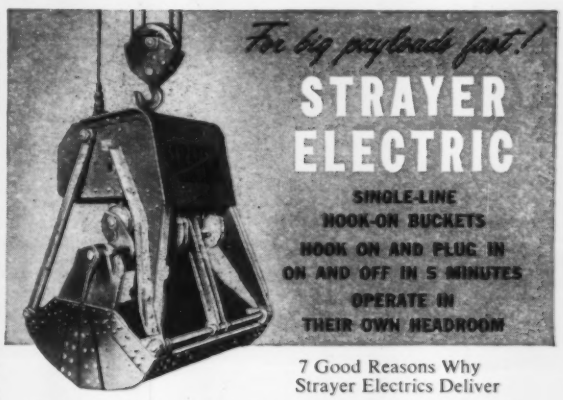
Lansdowne 2, Penna.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Refractories

Fire Clay Brick (per 1000)

High-Heat Duty: Ashland, Grahn, Hayward, Hitchins, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lock Haven, Lumber, Orviston, West Decatur, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parral, Portsmouth, O., Ottawa, Ill., Stevens Pottery, Ga., $135; Salina, Pa., $140; Niles, O., $138; Cutler, Utah, $165.

Super-Duty: Ironton, O., Vandalia, Mo., Olive Hill, Ky., Clearfield, Salina, Pa., New Savage, Md., St., Louis, $175; Stevens Pottery, Ga., $185; Cutler, Utah, $233.

Silica Brick (per 1000)

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Pt. Matilda, Pa., Portsmouth, O., Hawstone, Pa., $150; Warren, Niles, Windham, O., Hays, Latrobe, Morrisville, Pa., $155; E. Chicago, Ind., Joliet, Rockdale, Ill., $160; Lehigh, Utah, $175; Los Angeles, $180.

Super-Duty: Sproul, Hawstone, Pa., Niles, Warren, Windham, O., Leslie, Md., Athens, Tex., $157; Morrisville, Hays, Latrobe, Pa., $160; E. Chicago, Ind., $167; Curtner, Calif., $182.

Silica Brick (per 1000)

Clearfield, Pa., $140; Philadelphia, $137; Woodbridge, N. J., $135.

Ladle Brick (per 1000)

Dry Pressed: Aisey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Vanport, Pa., Mexico, Vandalia, Mo., Wellsville, Irondale, New Salisbury, O., $96.75; Clearfield, Pa., Portsmouth, O., $102.

High-Alumina Brick (per 1000)

50 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $235; Danville, Ill., $238; Philadelphia, Clearfield, Pa., $230; Orviston, Pa., $245.

60 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $295; Danville, Ill., $298; Philadelphia, Clearfield, Orviston, Pa., $305.

70 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $335; Danville, Ill., $338; Philadelphia, Clearfield, Orviston, Pa., $345.

Sleeves (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., St. Louis, $188.

Nozzles (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., St. Louis, $310.

Runners (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., $234.

Dolomite (per net ton)

Domestic, dead-burned, bulk, Billmeyer, Blue Bell, Williams, Plymouth Meeting, York, Pa., Millville, W. Va., Bettsville, Millersville, Martin, Woodville, Gibsonburg, Narlo, O., $16.75; Thornton, McCook, Ill., $17; Dolly Siding, Bonne Terre, Mo., $15.

Magnesite (per net ton)

Domestic, dead-burned, bulk ⅛ in. grains with fines: Chewelah, Wash., Luning, Nev., $46; ⅝ in. grains with fines: Baltimore, $73.

Fluorspar

Metallurgical grades, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content 72.5%, $37-41; 70%, $36.40; 60%, $33-36.50. Imported, net tons, f.o.b. cars point of entry duty paid, metallurgical grade: European, $33-34; Mexican, all-rail, duty paid, $25.25-25.75; barge, Brownsville, Tex., $27.25-27.75.

Ores

Lake Superior Iron Ore

(Prices effective for the 1957 shipping season, gross ton, 51.50% iron natural, rail of vessel, lower lake ports.)

Mesabi bessemer	$11.60
Mesabi nonbessemer	11.45
Old Range bessemer	11.85
Old Range nonbessemer	11.70
Open-hearth lump	12.70
High phos.	11.45

The foregoing prices are based on upper lake rail freight rates, lake vessel freight rates, handling and unloading charges, and taxes thereon, which were in effect Jan. 30, 1957, and increases or decreases after that date are absorbed by the seller.

Eastern Local Iron Ore

Cents per unit, deld. E. Pa.

New Jersey, foundry and basic 62-64% concentrates	25.00-27.00

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 65%	27.00-27.50
N. African hematite (spot)	nom.
Brazilian iron ore, 68-69%	28.00

Tungsten Ore

Net ton, unit

Foreign wolframite, good commercial quality	$13.50-14.25*
Domestic, concentrates f.o.b. milling points	20.00-22.00

*Before duty.

Manganese Ore

Mn 46-48%, Indian (export tax included), $1.35-1.40 per long ton unit, c.i.f. U. S. ports, duty for buyer's account; other than Indian, $1.35-1.40; contracts by negotiation.

Chrome Ore

Gross ton, f.o.b. cars New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., Tacoma, Wash.

Indian and Rhodesian

48% 3:1	$51.00-53.00
48% 2.8:1	48.00-50.00
48% no ratio	41.00-43.00

South African Transvaal

48% no ratio	$40.00-43.00
44% no ratio	30.00-30.50

Turkish

48% 3:1	$59.00

Domestic

Rail nearest seller

48% 3:1	$39.00

Molybdenum

Sulfide concentrate, per lb of Mo content, mines, unpacked	$1.18

Antimony Ore

Per short ton unit of Sb content, c.i.f. seaboard

55-60%	$2.50-2.60
60-65%	2.60-2.90

Vanadium Ore

Cents per lb V_2O_5

Domestic	31.00

Metal Powder

(Per pound f.o.b. shipping point in ton lots for minus 100 mesh, except as noted)

	Cents
Sponge Iron, Swedish: Deld. east of Mississippi River, ocean bags 23,000 lb and over.. F.o.b. Riverton or Camden, N. J., west of Mississippi River.	10.50 / 9.50
Sponge Iron, Domestic, 98 + % Fe: Deld. east of Mississippi River, 23,000 lb and over F.o.b. Riverton, N. J., west of Mississippi River	10.50 / 9.50
Electrolytic Iron: Melting stock, 99.9% Fe, irregular fragments of ⅛ in. x 1.3 in.	28.00
Annealed, 99.5% Fe..	36.50
Unannealed (99 + % Fe)	36.00
Unannealed (99 + % Fe) (minus 325 mesh)	59.00
Powder Flakes (minus 16, plus 100 mesh)..	29.00
Carbonyl Iron: 98.1-99.9%, 3 to 20 microns, depending on grade, 93.00-290.00 in standard 200-lb containers; all minus 200 mesh.	
Aluminum: Atomized, 500 lb drum, frght allowed: Carlots	39.50
Ton lots	41.50
Antimony, 500 lb lots	42.00*
Brass, 5000-lb lots	31.30-38.40†
Bronze, 5000-lb lots	48.10-52.70†
Copper: Electrolytic	14.25*
Reduced	14.25*
Lead	7.50*
Manganese: Minus 35 mesh	64.00
Minus 100 mesh	70.00
Minus 200 mesh	75.00
Nickel unannealed	*$1.065*
Nickel-Silver, 5000-lb lots	49.20-61.30†
Phosphor-Copper, 5000-lb lots	59.80
Copper (atomized) 5000-lb lots	40.30-48.80‡
Silicon	47.50
Solder	7.00*
Stainless Steel, 304	$1.02
Stainless Steel, 316	$1.20
Tin	14.50*
Zinc, 5000-lb lots	17.50-30.70‡
Tungsten: Melting grade, 99%	Dollars
60 to 2000 mesh: 1000 lb and over	3.15
Less than 1000 lb	3.30
Chromium, electrolytic 99.8% Cr min metallic basis	5.00

*Plus cost of metal. †Depending on composition. ‡Depending on mesh.

Electrodes

Threaded with nipple; unboxed, f.o.b. plant

GRAPHITE

Diam (in.)	Length (in.)	Per 100 lb
2	24	$60.75
2½	30	39.25
3	40	37.00
4	40	35.00
5⅛	40	34.75
6	60	31.50
7	60	28.25
8, 9, 10	60	28.00
12	72	26.75
14	60	26.75
16	72	25.75
17	60	26.25
18	72	26.25
20	72	25.25
24	84	26.00

CARBON

8	60	13.30
10	60	13.00
12	60	12.95
14	60	12.85
14	72	11.95
17	60	11.85
17	72	11.40
20	84	11.40
20	90	11.00
24	72, 84	11.25
24	96	10.95
30	84	11.05
40, 35	110	10.70
40	100	10.70

Metallurgical Coke

Price per net ton

Beehive Ovens

Connellsville, Pa., furnace	$14.75-15.75
Connellsville, Pa., foundry	18.00-18.50

Oven Foundry Coke

Birmingham, ovens	$28.85
Cincinnati, deld.	31.84
Buffalo, ovens	30.50
Camden, N. J., ovens	29.50
Detroit, ovens	30.50
Pontiac, Mich., deld.	32.25
Saginaw, Mich., deld	33.83
Erie, Pa., ovens	30.50
Everett, Mass., ovens New England, deld.	31.55*
Indianapolis, ovens	29.75
Ironton, O., ovens	29.00
Cincinnati, deld.	31.84
Kearny, N. J., ovens	29.75
Milwaukee, ovens	30.50
Painesville, O., ovens	30.50
Cleveland, deld.	32.69
Philadelphia, ovens	29.50
St. Louis, ovens	31.50
Neville Island (Pittsburgh), Pa., ovens	29.25
St. Paul, ovens	29.75
Chicago, deld.	33.24
Swedeland, Pa., ovens	29.50
Terre Haute, Ind., ovens	29.75

*Or within $4.85 freight zone from works.

Coal Chemicals

Spot, cents per gallon, ovens

Pure benzene	36.00
Toluene, one deg.	29.50
Industrial xylene	32.00-34.00

Per ton, bulk, ovens

Ammonium sulfate	$32.00-34.00

Cents per pound, producing point

Phenol: Grade 1, 17.50; Grade 2-3, 15.50; Grade 4, 17.50; Grade 5, 16.50; Grade 6, 14.50.

Imported Steel

(Base per 100 lb, landed, duty paid, based on current ocean rates. Any increase in these rates is for buyer's account. Source of shipment: Western continental European countries)

	North Atlantic	South Atlantic	Gulf Coast	West Coast
Deformed Bars, Intermediate, ASTM-A 305	$6.30	$6.25	$6.25	$6.50
Bar Size Angles	6.62	6.57	6.57	6.75
Structural Angles	6.62	6.57	6.57	6.75
I-Beams	6.87	6.82	6.82	7.00
Channels	6.87	6.82	6.82	7.00
Plates (basic bessemer)	8.35	8.30	8.30	8.60
Sheets, H.R.	8.25	8.20	8.20	8.50
Sheets, C.R. (drawing quality)	9.00	8.95	8.95	9.25
Furring Channels, C.R., 1000 ft, ⅞ x 0.30 lb per ft	26.79	26.67	26.67	27.36
Barbed Wire (†)	6.95	6.95	6.95	7.40
Merchant Bars	6.87	6.82	6.82	7.22
Hot-Rolled Bands	7.20	7.15	7.15	7.55
Wire Rods, Thomas Commercial No. 5	6.73	6.73	6.73	7.13
Wire Rods, O.H. Cold Heading Quality No. 5	7.07	7.07	7.07	7.47
Bright Common Wire Nails (‡)	8.38	8.38	8.38	8.58

†Per 82 lb, net, reel. ‡Per 100-lb kegs, 20d nails and heavier.

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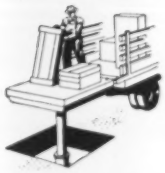

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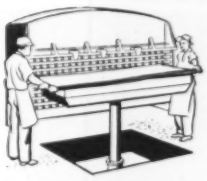

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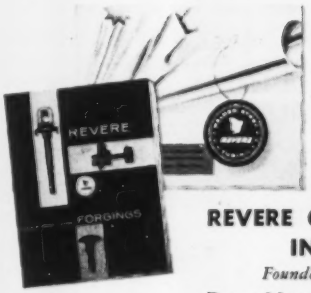

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Ferroalloys

MANGANESE ALLOYS

Spiegeleisen: Carlot, per gross ton, Palmerton, Pa. 21-23% Mn, $105; 19-21% Mn, 1-3% Si, $102.50: 16-19% Mn, $100.50.

Standard Ferromanganese: (Mn 74-76%, C 7% approx). Base price per net ton: $245, Johnstown, Duquesne, Sheridan, Pa.; Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. Add or subtract $2 for each 1% or fraction thereof of contained manganese over 76% or under 74% respectively.

(Mn 79-81%). Lump $263 per net ton, f.o.b. Anaconda or Great Falls, Mont. Add $2.60 for each 1% above 81%; subtract $2.60 for each 1% below 79%, fractions in proportion to nearest 0.1%.

High-Grade Low-Carbon Ferromanganese: (Mn 85-90%). Carload, lump, bulk, max 0.07% C, 35.1c per lb of contained Mn, carload packed 36.4c, ton lots 37.9c, less ton 39.1c. Delivered. Deduct 1.5c for max 0.15% C grade from above prices, 3c for max 0.03% C, 3.5c for max 0.50% C, and 6.5c for max 75% C—max 7% Si. **Special Grade:** (Mn 90% min, C 0.07% max, P 0.06% max). Add 2.05c to the above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.25-1.5%, Si 1.5% max). Carload, lump, bulk, 25.5c per lb of contained Mn, packed, carload 26.8c, ton lot 28.4c, less ton 29.6c. Delivered. Spot, add 0.25c.

Manganese Metal: 2" x D (Mn 95.5% min, Fe 2% max, Si 1% max, C 0.2%). Carload, lump, bulk, 45c per lb of metal; packed, 45.75c; ton lot 47.25c; less ton lot 49.25c. Delivered. Spot, add 2c.

Electrolytic Manganese Metal: Min carload, 34c; 2000 lb to min carload, 36c; 500 lb to 1999 lb, 38c; 50 lb cans, add 0.5c per lb. Premium for hydrogen-removed metal, 0.75c per lb. Prices are f.o.b. cars, Knoxville, Tenn., freight allowed to St. Louis or any point east of Mississippi; or f.o.b. Marietta, O., freight allowed.

Silicomanganese: (Mn 65-68%). Contract, lump, bulk 1.50% C grade, 18-20% Si, 12.8c per lb of alloy. Packed, c.l. 14c, ton 14.45c, less ton 15.45c, f.o.b. Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. For 2% C grade, Si 15-17%, deduct 0.2c from above prices. For 3% C grade Si 12-14.5%, deduct 0.4c from above prices. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max, Si 4% max, C 0.10% max). Contract, ton lot, 2" x D, $1.50 per lb of contained Ti; less ton $1.55. (Ti 38-43%, Al 8% max, Si 4% max, C 0.10% max). Ton lot $1.35, less ton $1.37, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot, add 5c.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract $200 per ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi River and north of Baltimore and St. Louis.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 2-4.5%). Contract $225 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.l. lump, bulk 28.75c per lb of contained Cr; c.l. packed 30.30c, ton lot 32.05c; less ton 33.45c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: Cr 63-66% (Simplex), carload, lump, bulk, C 0.025% max, 36.75c per lb contained Cr; 0.010% max, 37.75c. Ton lot, add 3.5c; less ton, add 5.2c. Delivered.
Cr 67.71%, carload, lump, bulk, C 0.02% max, 41.00c per lb contained Cr; 0.025% max, 39.75c; 0.05% max, 39.00c; 0.10% max, 38.50c; 0.20% max, 38.25c; 0.50% max, 38.00c; 1.0% max, 37.75c; 1.5% max, 37.50c; 2.0% max, 37.25c. Ton lot, add 3.4c; less ton lot, add 5.1c. Delivered.

Foundry Ferrochrome, High-Carbon: (Cr 62-66%, C 5-7%, Si 7-10%). Contract, c.l., 2 in. x D, bulk 30.05c per lb of contained Cr. Packed, c.l. 31.65c, ton 33.45c, less ton 34.95c. Delivered. Spot, add 0.25c.

Foundry Ferrosilicon Chrome: (Cr 50-54%, Si 28-32%, C 1.25% max). Contract, carload, packed, 8M x D, 21.25c, per lb of alloy, ton lot 22.50c; less ton lot 23.70c. Delivered. Spot, add 0.25c.

Ferrochrome-Silicon: Cr 39-41%, Si 42-45%, C 0.05% max or Cr 33-36%, Si 45-48%, C 0.05% max. Carload, lump, bulk, 3" x down and 2" x down, 27.50c per lb contained Cr, 14.20c per lb contained Si. 0.75" x down, 28.65c per lb contained Cr, 14.20c per lb contained Si. Delivered.

Chromium Metal Electrolytic: Commercial grade (Cr 99.8% min, metallic basis, Fe 0.2% max). Contract, carlot, packed 2" x D plate (about ½" thick) $1.29 per lb, ton lot $1.31, less ton lot $1.33. Delivered. Spot, add 5c.

VANADIUM ALLOYS

Ferrovanadium: Open-hearth grade (V 50-55%, Si 8% max, C 3% max). Contract, any quantity, $3.20 per lb of contained V. Delivered. Spot, add 10c. **Special Grade:** (V 50-55% or 70-75%, Si 2% max, C 0.5% max) $3.30. **High Speed Grade:** (V 50-55%, or 70-75%, Si 1.50% max, C 0.20% max) $3.40.

Grainal: Vanadium Grainal No. 1 $1.05 per lb; No. 6, 68c; No. 79, 50c, freight allowed.

Vanadium Oxide: Contract less carload lot, packed $1.38 per lb contained V_2O_5, freight allowed. Spot, add 5c.

SILICON ALLOYS

25-30% Ferrosilicon: Contract, carload, lump, bulk, 20.0c per lb of contained Si. Packed 21.40c; ton lot 22.50c, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump, bulk, 14.20c per lb of contained Si. Packed c.l. 16.70c, ton lot 18.15c, less ton 19.80c, f.o.b. Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max). Add 1.45c to 50% ferrosilicon prices.

65% Ferrosilicon: Contract, carload, lump, bulk, 15.25c per lb contained silicon. Packed, c.l. 17.25c, ton lot 19.05c; less ton 20.4c. Delivered. Spot, add 0.35c.

75% Ferrosilicon: Contract, carload, lump, bulk, 16.4c per lb of contained Si. Packed, c.l. 18.30c, ton lot 19.95c, less ton 21.2c. Delivered. Spot, add 0.3c.

90% Ferrosilicon: Contract, carload, lump, bulk, 19.5c per lb of contained Si. Packed, c.l. 21.15c, ton lot 22.55c, less ton 23.6c. Delivered. Spot, add 0.25c.

Silicon Metal: (98% min Si, 0.75% max Fe, 0.07% max Ca). C.l. lump, bulk, 22.00c per lb of Si. Packed, c.l. 23.65c, ton lot 24.95c, less ton 25.95c. Add 0.5c for max 0.03% Ca grade. Deduct 0.5c for max 1% Fe grade analyzing min 99.75% Si; 0.75c for max 1.25% Fe grades analyzing min 96.75% Si. Spot, add 0.25c.

Alsifer: (Approx 20% Al, 40% Si, 40% Fe). Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 10.65c per lb of alloy; ton lot, packed, 11.8c.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15%, Si 39-43%, C 0.20% max). Contract, c.l. lump, bulk 9.25c per lb of alloy. Packed, c.l. 10.45c, ton lot 11.6c, less ton 12.45c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max). Contract, carload, lump, packed 27.25c per lb of alloy, ton lot 28.4c, less ton 29.65c. Freight allowed. Spot, add 0.25c.

BORON ALLOYS

Ferroboron: (B 17.50% min, Si 1.50% max, Al 0.50% max, C 0.50% max). Contract, 100 lb or more 1" x D, $1.20 per lb of alloy; less than 100 lb $1.30. Delivered. Spot, add 5c. F.o.b. Washington, Pa., prices, 100 lb and over, are as follows: Grade A (10-14% B) 85c per lb; Grade B (14-18% B) $1.20; Grade C (19% min B) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si). Carload, bulk, lump, or 3" x D, $5.25 per lb of contained B. Packed, carload $5.40, ton to c.l. $5.50, less ton $5.60. Delivered.

Bortam: (B 1.5-1.9%). Ton lot, 45c per lb; less than ton lot, 50c per lb.

Carbortam: (1 to 2%). Contract, lump, carload 9.50c, per lb f.o.b. Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18%, and Si 53-59%). Contract, carload, lump, bulk 23c per lb of alloy, carload packed 24.25c, ton lot 26.15c, less ton 27.15c. Delivered. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.5-3%). Contract, carload, lump, bulk 24c per lb of alloy, carload packed 25.65c, ton lot 27.95c, less ton 29.45c. Delivered. Spot, add 0.25c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx 3¾ lb each and containing 2 lb of Cr). Contract, carload, bulk 19.60c per lb of briquet, carload packed in box pallets 19.80c, in bags 20.70c; 3000 lb to c.l. in box pallets 21.00c; 2000 lb to c.l. in bags, 21.90c; less than 2000 lb in bags 22.80c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx 3 lb and containing 2 lb of Mn). Contract, carload, bulk 14.8c per lb of briquet; c.l., packed, pallets 15c, bags 16c; 3000 lb to c.l., pallets 16.2c; 2000 lb to c.l. bags, 17.2c; less ton 18.1c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx 3½ lb and containing 2 lb of Mn and approx ½ lb of Si). Contract, c.l. bulk 15.1c per lb of briquet; c.l. packed, pallets, 15.3c; bags 16.3c, 3000 lb to c.l., pallets, 16.5c; 2000 lb to c.l., bags 17.5c; less ton 18.4c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx 5 lb and containing 2 lb of Si). Contract, carload, bulk 7.7c per lb of briquet; packed, pallets, 7.9c; bags 8.9c; 3000 lb to c.l., pallets 9.5c; 2000 lb to c.l. bags 10.5c; less ton 11.4c. Delivered. Spot, add 0.25c. (Small size—weighing approx 2½ lb and containing 1 lb of Si). Carload, bulk 7.85c. Packed, pallets 8.05c; bags 9.05c; 3000 lb to c.l. pallets 9.65c; 2000 lb to c.l. bags 10.65c; less ton 11.55c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each). $1.41 per pound of Mo contained, f.o.b. Langeloth, Pa.

TUNGSTEN ALLOYS

Ferrotungsten: (70-80%), 5000 lb W or more $2.95 per lb of contained W; 2000 lb W to 5000 lb W, $3.05; less than 2000 lb W, $3.17. Delivered.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 50-60%, Si 8% max, C 0.4% max). Contract, ton lot 2" x D, $4.90 per lb of contained Cb. Delivered. Spot, add 10c.

Ferrotantalum—Columbium: (Cb 40% approx, Ta 20% approx, and Cb plus Ta 60% min, C 0.30% max). Ton lot 2" x D, $4.25 per lb of contained Cb plus Ta, delivered; less ton lot $4.30.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5.7%, Fe 20% approx). Contract, c.l. packed ½-in. x 12 M 20.00c per lb of alloy, ton lot 21.15c, less ton 22.40c. Delivered. Spot, add 0.25c.

Graphidox No. 5: (Si 48-52%, Ca 5-7%, Ti 9-11%). C.l. packed, 19c per lb of alloy, ton lot 20.15c; less ton lot 21.4c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed 18.1c per lb of alloy; ton lot 19.55c; less ton lot 20.8c, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis.

Simanal: (Approx 20% each Si, Mn, Al; bal Fe). Lump, carload, bulk 18.50c. Packed c.l. 19.50c, 2000 lb to c.l. 20.50c, less than 2000 lb 21c per lb of alloy. Delivered.

Ferrophosphorus: (23-25% based on 24% P content with unitage of $4 for each 1% of P above or below the base); carload, f.o.b. sellers' works. Mt. Pleasant, Siglo, Tenn., $110 per gross ton.

Ferromolybdenum: (55-75%). Per lb of contained Mo, in 200-lb container, f.o.b. Langeloth and Washington, Pa. $1.68 in all sizes except powdered which is $1.74.

Technical Molybdic-Oxide: Per lb of contained Mo, in cans, $1.39; in bags, $1.38, f.o.b. Langeloth and Washington, Pa.

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Downswing in Scrap Is Unchecked

Prices register further decline as consumers stay on sidelines and material begins to pile up in yards. STEEL's composite on the prime grade drops to $35.33, off another $1.50 a ton

Scrap Prices, Page 190

Philadelphia—Further weakness is noted in domestic scrap prices. Prime grades of open-hearth material are lower at $36.50, delivered, on light buying. Prices on the secondary grades are unchanged. Electric furnace bundles are off $1 at $44, and heavy turnings are also down $1 at $32.50. Low phos structurals and plates are easier at $45-$47, and railroad specialties are nominally lower at $54 for couplers, spring and wheels, and $66-$67 for rail crops, 2 ft and under. No. 1 cupola and heavy breakable cast are lower at $41.

Contributing to the weaker tone is an easing in export demand. One cargo vessel of steel scrap is being loaded here, and another is scheduled to be loaded within a week or so, but beyond that, nothing is in prospect for shipment from this port in the foreseeable future.

The Pennsylvania Railroad will close Nov. 5 on 18,465 net tons of ferrous scrap, including 3500 tons of No. 1 heavy melting steel, 3800 tons of No. 1 rerolling rail, and 2500 tons of steel cars, cut to load.

New York—Brokers again have reduced buying prices on most grades, with domestic consumer buying slow, export demand off, and yard stocks accumulating.

Prices on No. 1 heavy melting and No. 1 bundles are now $34-$35, and on No. 2 heavy melting, $29-$30. Only No. 2 bundles, of the major open hearth grades, are unchanged.

Machine shop turnings are lower at $11-$12, mixed borings and turnings are $13-$14, short shoveling turnings are $15-$16, and low phos structurals and plate, $45-$46. Heavy breakable cast is down $1 at $33-$34.

With consumption slack, prices on nickel bearing stainless steel scrap have dipped sharply. Brokers are offering no more than $165-$175 for 18-8 sheets, clips, and solids, a drop of $10 a ton. On 18-8 borings and turnings they are offering $55-$60, down $20 a ton. Prices on the straight chromium grades are unchanged.

Boston — Heavy melting steel scrap prices are lower. Brokers are paying $27-$28 for No. 1 heavy melting, shipping point, but buying is sluggish. No. 2 steel bundles are off $5 a ton to $19-$20, shipping point. Cast iron prices are for the most part nominal, with buying at a minimum.

Chicago—Few sales are reported. The market continues to sag, though less drastically than it has in recent weeks. In most cases, price declines of $1 to $2 a ton are noted. Only rerolling rail and axles dipped as much as $3.

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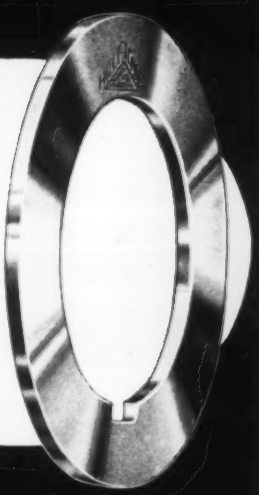

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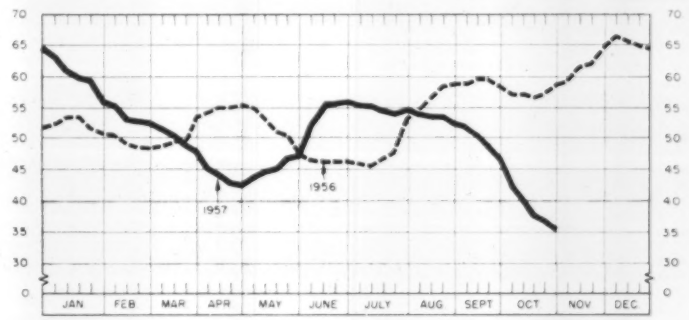
STEELMAKING SCRAP PRICE COMPOSITE

Based on No. 1 heavy melting grade at Pittsburgh, Chicago, and eastern Pennsylvania—Compiled by STEEL



Oct. 30 1957	Week Ago	Month Ago	Year Ago	Sept. Avg.
$35.33	$36.83	$42.17	$58.67	$47.73

Brokers and dealers are not pushing for sales, apparently being content to sit tight in hope of an upturn in demand and improved prices. Consumers hold substantial inventories and are not actively increasing their holdings.

Pittsburgh—Bids closing soon for railroad and industrial scrap will give a clearer indication of the local market's position than has been discernible for several weeks. Prices continued to drop an average of $2 a ton last week, based on brokers' estimates in the absence of mill buying. Market observers doubt the decline has ended, but they say it is difficult to buy large tonnage at current quotations.

Cleveland — Automotive scrap lists are closing on bids averaging under $31 on No. 1 factory bundles. Large tonnages are involved, one lot totaling 15,000 tons. As a result of the lower prices on factory scrap, quotations on steel grades generally are off another $2, with No. 1 heavy melting $30-$31. All prices are nominal in the absence of representative buying by consumers. Prices on railroad scrap are unchanged, but quotations are nominal. Small railroad lists are expected to be out this week.

Youngstown—A further decline in the nominal prices quoted is expected here. Dealers see no early end of the current slump in their market. Material is piling up in yards and at steel plants. Local sellers can't ship into adjacent consuming markets because of a $4 to $5 a ton freight disadvantage.

Buffalo—Prices continue on the downside, but lists are largely nominal in the absence of new orders. Dealers anticipate a further drop when November mill contracts are placed. Prices already are down $2 from early October levels.

If the market continues under pressure, dealers say No. 1 heavy melting will likely fall to a range of $32-$33 this month. No. 2 grades, though, are not expected to decline as sharply.

Cupola cast has been reduced $1 to a range of $42-$43.

Detroit — Prices have moved down several dollars, but no new buying is reported here, except for a few orders from outside the area. The general feeling is that scrap will hold about at present levels, possibly a bit lower, until December. The outcome of bids on month-end automotive lists is awaited.

Cincinnati—Prices on the principal grades are off another $3 a ton. No. 1 heavy melting is $33-$34. Weakness has spread through the entire scrap list, with railroad steel grades dropping $3 to $5 a ton.

Birmingham—Buying of scrap is hand-to-mouth here. Cast iron consumers are taking some tonnage, but only enough to maintain inventories. Open hearth and elec-

(*Please turn to Page* 195)

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Iron and Steel Scrap

Consumer prices per gross ton, except as otherwise noted, including broker's commission, as reported to STEEL, Oct. 30, 1957. *Changes shown in italics.*

STEELMAKING SCRAP COMPOSITE

Oct. 30	$35.33
Oct. 23	36.83
Sept. Avg.	47.73
Oct. 1956	57.27
Oct. 1952	43.00

Based on No. 1 heavy melting grade at Pittsburgh, Chicago, and eastern Pennsylvania.

PITTSBURGH

No. 1 heavy melting	*35.00-36.00*
No. 2 heavy melting	*32.00-33.00*
No. 1 factory bundles	*41.00-42.00*
No. 1 dealer bundles	*35.00-36.00*
No. 2 bundles	30.00-31.00
No. 1 busheling	*35.00-36.00*
Machine shop turnings	20.00-21.00
Mixed borings, turnings	20.00-21.00
Short shovel turnings	23.00-24.00
Cast iron borings	23.00-24.00
Cut structurals:	
2 ft and under	*41.00-42.00*
3 ft lengths	*40.00-41.00*
Heavy turnings	*33.00-34.00*
Punchings & plate scrap	*40.00-41.00*
Electric furnace bundles	*40.00-41.00*

Cast Iron Grades

No. 1 cupola	42.00-43.00
Stove plate	36.00-37.00
Unstripped motor blocks	29.00-30.00
Clean auto cast	45.00-46.00
Drop broken machinery	54.00-55.00

Railroad Scrap

No. 1 R.R. heavy melt.	*39.00-40.00*
Rails, 2 ft and under	*59.00-60.00*
Rails, 18 in. and under	*60.00-61.00*
Angles, splice bars	*53.00-54.00*
Rails, rerolling	*59.00-60.00*

Stainless Steel Scrap

18-8 bundles & solids	210.00-215.00
18-8 turnings	115.00-120.00
430 bundles & solids	95.00-100.00
430 turnings	65.00-70.00

CLEVELAND

No. 1 heavy melting	*30.00-31.00*
No. 2 heavy melting	25.00-26.00
No. 1 factory bundles	*33.00-34.00*
No. 1 bundles	*30.00-31.00*
No. 2 bundles	22.00-23.00
No. 1 busheling	*30.00-31.00*
Machine shop turnings	12.00-13.00
Short shovel turnings	16.00-17.00
Mixed borings, turnings	16.00-17.00
Cast iron borings	16.00-17.00
Cut foundry steel	34.00-35.00
Cut structurals, plates 2 ft and under	39.00-40.00
Low phos. punchings & plate	*31.00-32.00*
Alloy free, short shovel turnings	22.00-23.00
Electric furnace bundles	33.00-34.00

Cast Iron Grades

No. 1 cupola	42.00-43.00
Charging box cast	34.00-35.00
Heavy breakable cast	32.00-33.00
Stove plate	40.00-41.00
Unstripped motor blocks	27.00-28.00
Brake shoes	31.00-32.00
Clean auto cast	42.00-43.00
Burnt cast	29.00-30.00
Drop broken machinery	46.00-47.00

Railroad Scrap

No. 1 R.R. heavy melt.	37.00-38.00
R.R. malleable	53.00-54.00
Rails, 2 ft and under	60.00-61.00
Rails, 18 in. and under	61.00-62.00
Rails, random lengths	55.00-56.00
Cast steel	52.00-53.00
Railroad specialties	52.00-53.00
Uncut tires	47.00-48.00
Angles, splice bars	52.00-53.00
Rails, rerolling	60.00-61.00

Stainless Steel
(Brokers' buying prices, f.o.b. shipping point)

18-8 bundles, solids	*205.00-210.00*
18-8 turnings	*90.00-95.00*
430 clips, bundles, solids	75.00-80.00
430 turnings	40.00-50.00

YOUNGSTOWN

No. 1 heavy melting	*33.00-34.00*
No. 2 heavy melting	*29.00-30.00*
No. 1 bundles	*33.00-34.00*
No. 2 bundles	*26.00-27.00*
No. 1 busheling	*33.00-34.00*
Machine shop turnings	14.00-15.00
Short shovel turnings	18.00-19.00
Cast iron borings	18.00-19.00
Low phos.	*35.00-36.00*
Electric furnace bundles	*35.00-36.00*

Railroad Scrap

No. 1 R.R. heavy melt.	40.00-41.00

CHICAGO

No. 1 heavy melt., indus.	*35.00-36.00*
No. 1 hvy melt., dealer	*32.00-34.00*
No. 2 heavy melting	29.00-30.00
No. 1 factory bundles	*37.00-38.00*
No. 1 dealer bundles	*33.00-35.00*
No. 2 bundles	*20.00-21.00*
No. 1 busheling, indus.	36.00-37.00
No. 1 busheling dealer	33.00-34.00
Machine shop turnings	17.00-18.00
Mixed borings, turnings	19.00-20.00
Short shovel turnings	19.00-20.00
Cast iron borings	19.00-20.00
Cut structurals, 3 ft.	*39.00-40.00*
Punchings & plate scrap	*40.00-41.00*

Cast Iron Grades

No. 1 cupola	35.00-36.00
Stove plate	34.00-35.00
Unstripped motor blocks	27.00-28.00
Clean auto cast	40.00-41.00
Drop broken machinery	40.00-41.00

Railroad Scrap

No. 1 R.R. heavy melt.	*37.00-38.00*
R.R. malleable	*45.00-46.00*
Rails, 2 ft and under	*49.00-50.00*
Rails, 18 in. and under	*50.00-51.00*
Angles, splice bars	*46.00-47.00*
Axles	*49.00-50.00*
Rails, rerolling	*49.00-50.00*

Stainless Steel Scrap

18-8 bundles & solids	205.00-215.00
18-8 turnings	105.00-115.00
430 bundles & solids	80.00-90.00
430 turnings	50.00-55.00

DETROIT

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*22.00-23.00*
No. 2 heavy melting	*18.00-19.00*
No. 1 bundles	*21.00-22.00*
No. 2 bundles	*18.00-19.00*
No. 1 busheling	*21.00-22.00*
Machine shop turnings	*9.00-10.00*
Mixed borings, turnings	*10.00-11.00*
Short shovel turnings	*11.00-12.00*
Punchings & plate scrap	26.00-27.00†

Cast Iron Grades

No. 1 cupola	34.00†
Stove plate	*28.00*
Charging box cast	*27.00*
Heavy breakable	*27.00*
Unstripped motor blocks	15.00†
Clean auto cast	*36.00*
Malleable	36.00†

†Nominal

ST. LOUIS

(Brokers' buying prices)

No. 1 heavy melting	39.00
No. 2 heavy melting	37.00
No. 1 bundles	39.00
No. 2 bundles	29.00
No. 1 busheling	39.00
Machine shop turnings	17.00
Short shovel turnings	19.00

Cast Iron Grades

No. 1 cupola	45.00
Charging box cast	37.00
Heavy breakable cast	37.00
Unstripped motor blocks	37.00
Brake shoes	40.00
Clean auto cast	46.00
Stove plate	39.00

Railroad Scrap

No. 1 R.R. heavy melt.	*38.25*
Rails, 18 in. and under	*55.00*
Rails, random lengths	*50.00*
Rails, rerolling	*57.50*
Angles, splice bars	*49.00*

PHILADELPHIA

No. 1 heavy melting	*36.50*
No. 2 heavy melting	33.50
No. 1 bundles	*36.50*
No. 2 bundles	27.50
No. 1 busheling	*36.50*
Electric furnace bundles	*44.00*
Mixed borings, turnings	23.00†
Short shovel turnings	25.00
Machine shop turnings	22.00†
Heavy turnings	*32.50*
Structurals & plate	*45.00-47.00*
Couplers, springs, wheels	*54.00†*
Rail crops, 2 ft & under	*66.00-67.00†*

Cast Iron Grades

No. 1 cupola	*41.00*
Heavy breakable cast	*41.00*
Malleable	59.00
Drop broken machinery	51.00-52.00

†Nominal

NEW YORK

(Brokers' buying prices)

No. 1 heavy melting	*34.00-35.00*
No. 2 heavy melting	*29.00-30.00*
No. 1 bundles	*34.00-35.00*
No. 2 bundles	24.00-25.00
Machine shop turnings	*11.00-12.00*
Mixed borings, turnings	*13.00-14.00*
Short shovel turnings	*15.00-16.00*
Low phos. (structurals & plate	*45.00-46.00*

Cast Iron Grades

No. 1 cupola	39.00-40.00
Unstripped motor blocks	32.00-33.00
Heavy breakable	*33.00-34.00*

Stainless Steel

18-8 sheets, clips, solids	*165.00-175.00*
18-8 borings, turnings	*55.00-60.00*
430 sheets, clips, solids	55.00-60.00
410 sheets, clips, solids	50.00-55.00

†Nominal

BOSTON

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*27.00-28.00*
No. 2 heavy melting	*24.00-25.00*
No. 1 bundles	*27.00-28.00*
No. 2 bundles	*19.00-20.00*
No. 1 busheling	*27.00-28.00*
Machine shop turnings	10.00-11.00
Mixed borings, turnings	11.00-12.00
Short shovel turnings	12.00-13.00
No. 1 cast	33.00-34.00
Mixed cupola cast	32.00-33.00
No. 1 machinery cast	38.00-39.00

BUFFALO

No. 1 heavy melting	36.00-37.00
No. 2 heavy melting	32.50-33.50
No. 1 bundles	36.00-37.00
No. 2 bundles	29.50-30.50
No. 1 busheling	36.00-37.00
Mixed borings, turnings	21.00-22.00
Machine shop turnings	19.00-20.00
Short shovel turnings	22.00-23.00
Cast iron borings	21.00-22.00
Low phos.	41.00-42.00

Cast Iron Grades
(F.o.b. shipping point)

No. 1 cupola	*42.00-43.00*
No. 1 machinery	47.00-48.00

Railroad Scrap

Rails, random lengths	50.00-51.00
Rails, 3 ft and under	55.00-56.00
Railroad specialties	43.00-44.00

CINCINNATI

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*33.00-34.00*
No. 2 heavy melting	*29.00-30.00*
No. 1 bundles	*33.00-34.00*
No. 2 bundles	*25.00-26.00*
No. 1 busheling	*33.00-34.00*
Machine shop turnings	*18.00-19.00*
Mixed borings, turnings	*18.00-19.00*
Short shovel turnings	*21.00-22.00*
Cast iron borings	*21.00-22.00*
Low phos. 18 in.	*40.00-41.00*

Cast Iron Grades

No. 1 cupola	*35.00-36.00*
Heavy breakable cast	*32.00-33.00*
Charging box cast	*32.00-33.00*
Drop broken machinery	*47.00-48.00*

Railroad Scrap

No. 1 R.R. heavy melt.	*36.00-37.00*
Rails, 18 in. and under	*57.00-58.00*
Rails, random lengths	*49.00-50.00*

BIRMINGHAM

No. 1 heavy melting	*34.00-35.00*
No. 2 heavy melting	*29.00-30.00*
No. 1 bundles	*34.00-35.00*
No. 2 bundles	*20.00-21.00*
No. 1 busheling	*34.00-35.00*
Cast iron borings	*19.00-20.00*
Short shovel turnings	21.00-22.00
Machine shop turnings	*20.00-21.00*
Bar crops and plates	*39.00-40.00*
Structurals & plate	*39.00-40.00*
Electric furnace bundles	*38.00-39.00*
Electric furnace:	
5 ft and under	*36.00-37.00*
2 ft and under	*37.00-38.00*

Cast Iron Grades

No. 1 cupola	47.00-48.00
Stove plate	*47.00-48.00*
Unstripped motor blocks	*36.00-37.00*
Charging box cast	*25.00-26.00*
No. 1 wheels	*38.00-39.00*

Railroad Scrap

No. 1 R.R. heavy melt	37.00-38.00
Rails, 18 in. and under	*50.00-51.00*
Rails, rerolling	55.00-56.00
Rails, random lengths	*45.00-46.00*
Angles, splice bars	43.00-44.00

SEATTLE

No. 1 heavy melting	*34.00†*
No. 1 bundles	*32.00†*
No. 2 heavy melting	*32.00†*
No. 2 bundles	*21.00†*
Machine shop turnings	26.00†
Mixed borings, turnings	26.00†
Electric furnace No. 1	35.00†

Cast Iron Grades

No. 1 cupola	35.00†
Heavy breakable cast	32.00†
Unstripped motor blocks	27.00†
Stove plate (f.o.b. plant)	25.00†

†Nominal

LOS ANGELES

No. 1 heavy melting	*39.00*
No. 2 heavy melting	*37.00*
No. 1 bundles	*38.00*
No. 2 bundles	*30.00*
Machine shop turnings	*20.00*
Shoveling turnings	*25.00*
Cast iron borings	*25.00*
Cut structurals and plate, 1 ft and under	*54.00*

Cast Iron Grades
(F.o.b. shipping point)

No. 1 cupola	*52.00*

Railroad Scrap

No. 1 R.R. heavy melt.	*39.00*

SAN FRANCISCO

No. 1 heavy melting	39.00
No. 2 heavy melting	37.00
No. 1 bundles	38.00
No. 2 bundles	30.00
Machine shop turnings	27.00
Mixed borings, turnings	27.00
Cast iron borings	27.00
Heavy turnings	27.00
Short shovel turnings	27.00
Cut structurals, 3 ft	50.00

Cast Iron Grades

No. 1 cupola	50.00-52.00
Charging box cast	45.00
Stove plate	46.00
Heavy breakable cast	40.00
Unstripped motor blocks	40.00
Clean auto cast	50.00-52.00
No. 1 wheels	45.00
Drop broken machinery	50.00-52.00

HAMILTON, ONT.

No. 1 heavy melting	38.00
No. 2 heavy melting	33.00
No. 1 bundles	38.00
No. 2 bundles	28.00
Mixed steel scrap	33.00
Mixed borings, turnings	21.00
Busheling, new factory:	
Prepared	38.00
Unprepared	32.00
Short steel turnings	23.00
Rails, rerolling	47.00

Cast Iron Grades†

No. 1 machinery cast	50.00

†F.o.b. Hamilton, Ont.

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Stockpile Probe To Start

ODM's Gray appoints committee to re-evaluate stockpile requirements in "nuclear age." Third quarter earnings off. Availability of nickel reported to be at all-time high

Nonferrous Metal Prices, Pages 194 & 195

THE GOVERNMENT will take a long look at its strategic stockpile program through a nonpartisan committee.

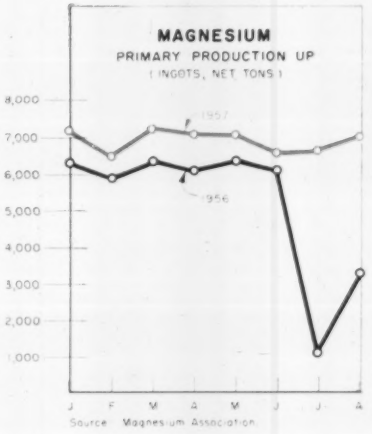
Gordon Gray, director of the Office of Defense Mobilization, is expected to name the 12-man group momentarily. The odds are it will be composed of people with an intimate knowledge of the program but who haven't "any axes to grind." One Washington source reports the committee chairman and chief assistant have been working behind closed doors at the ODM for at least the last two or three weeks. It tends to back up Mr. Gray's statement that a report could be ready by yearend.

Originally, the stockpile was set up to provide an emergency source of strategic metals in case of war. But the program has come under increased attack from some Congressional leaders who question its value in the "nuclear age." Some, like Sen. A. Willis Robertson (D., Va.), chairman of the Joint Defense Production Committee, have long advocated disposal of unneeded metal.

Problem—The stockpile question is a political hot potato. If the committee proposes its continuation, look for noise from Capitol Hill. But disposal of any part of the stockpile would require Congressional action, and it seems certain that Democrats and Republicans from the mining states would fight any such action.

Lead and zinc would be most seriously affected by any change in the program. (Average monthly shipments of lead to stockpile this year are estimated at about 8000 tons, zinc at around 12,000 tons.) A STEEL check of leading producers finds little worry about the government dumping metal on the open market. "It would destroy the domestic price," says one executive, "and the government knows it."

Outlook—There are differences of opinion inside the industry, though, on whether the program itself will be discontinued. Says one observer: "The committee's recommendations will probably just gather dust like many other government reports, and the stockpile will die a natural death over a period of time." But another highly placed metalman says he believes the lead and zinc programs will end next year.



It's felt in most quarters that an end to the lead and zinc stockpile will hinge on whether the industry gets a protective tariff. "Without the stockpile or a tariff, stocks would zoom and prices fall," sums up an observer.

Even if some metals were taken off the essential list, it would not necessarily signal the end of stockpiling. There is a possibility the committee would recommend some of the glamour metals, like boron, be stockpiled for defense reasons.

Metal Earnings Off

A look at the nonferrous industry's earnings for the first nine months shows that profits are off in almost all categories. Falling metal prices is the reason most often quoted; the slump in demand rates a close second. The increasing costs of labor and supplies have also hurt many firms.

Enough Nickel

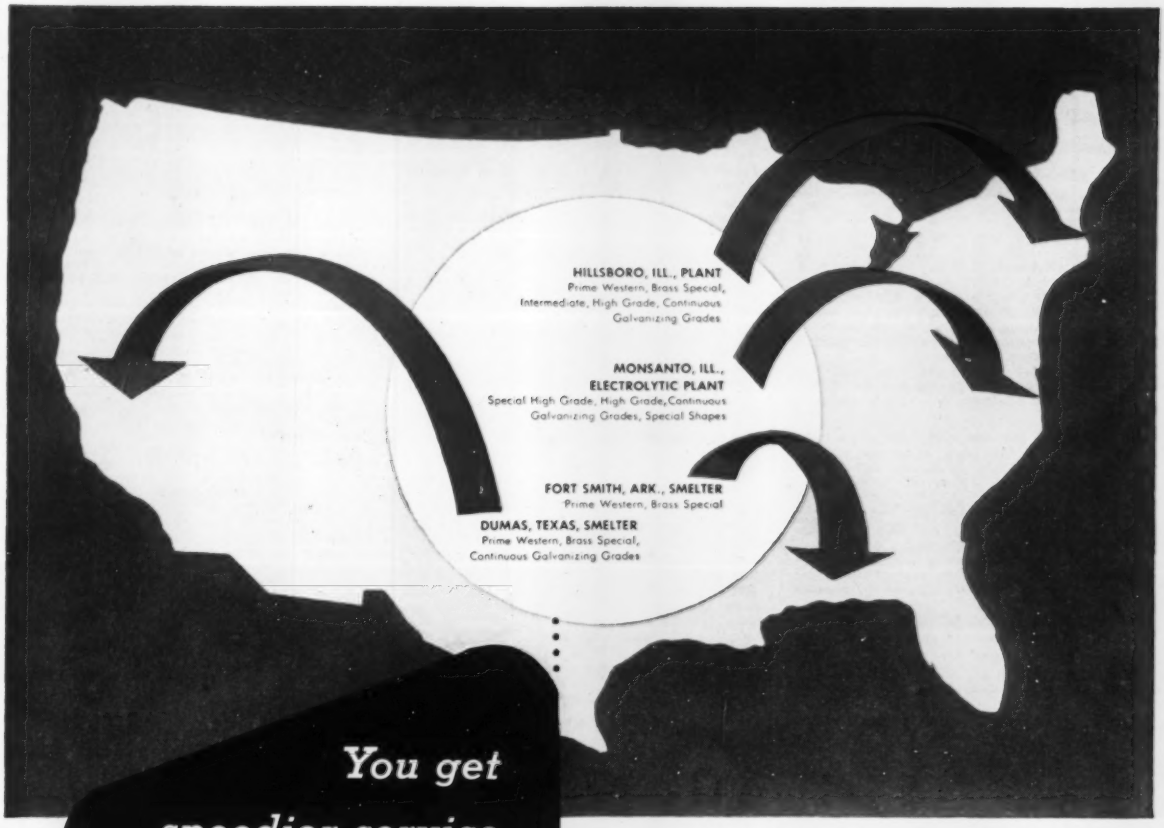
Domestic availability of nickel for civilian use is reported to be at an all-time high. No complaints are being received in Washington about lack of supply. (It's rumored that consumers' stocks stand close to 45 million lb.) In fact, industry sources admit it's almost impossible to sell the premium grade.

Look for a boost in consumption by 1958's third quarter. Reason: The aircraft industry is living off its nickel inventories. Washington observers believe the Defense Department will have to come into the market for substantial tonnages by then.

NONFERROUS PRICE RECORD

	Price Oct. 30	Last Change	Previous Price	Sept. Avg	Aug. Avg	Oct., 1956 Avg
Aluminum ..	26.00	Aug. 1, 1957	25.00	26.000	26.000	25.000
Copper	25.50-27.00	Oct. 15, 1957	26.00-27.00	26.469	28.639	38.365
Lead	13.30	Oct. 14, 1957	13.80	13.800	13.800	15.800
Magnesium .	35.25	Aug. 13, 1956	33.75	35.250	35.250	35.250
Nickel	74.00	Dec. 6, 1956	64.50	74.000	74.000	64.500
Tin	91.00	Oct. 30, 1957	91.375	93.422	94.259	105.981
Zinc	10.00	July 1, 1957	10.50	10.000	10.000	13.500

Quotations in cents per pound based on: COPPER, deld. Conn. Valley; LEAD, common grade, deld. St. Louis; ZINC, prime western, E. St. Louis; TIN, Straits, deld. New York; NICKEL, electrolytic cathodes, 99.9%, base size at refinery, unpacked; ALUMINUM, primary pig, 99.5+%, deld.; MAGNESIUM, pig, 99.8%, Velasco, Tex.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Nonferrous Metals

Cents per pound, carlots except as otherwise noted.

PRIMARY METALS AND ALLOYS

Aluminum: 99.5%, pigs, 26.00; ingots, 28.10, 10,000 lb or more, f.o.b. shipping point. Freight allowed on 500 lb or more.

Aluminum Alloy: No. 13, 29.90; No. 43, 29.70; No. 195, 31.30; No. 241, 31.50; No. 356, 29.90, 30-lb ingots.

Antimony: R.M.M. brand, 99.5%, 33.00; Lone Star brand, 33.50, f.o.b. Laredo, Tex., in bulk. Foreign brands, 99.5%, 27.50-28.00, New York, duty paid, 10,000 lb or more.

Beryllium: 97% lump or beads, $71.50 per lb, f.o.b. Cleveland or Reading, Pa.

Beryllium Aluminum: 5% Be, $74.75 per lb of contained Be, with balance as Al at market price, f.o.b. shipping point.

Beryllium Copper: 3.75-4.25% Be, $43 per lb of contained Be, with balance as Cu at market price on shipment data, f.o.b. shipping point.

Bismuth: $2.25 per ton, ton lots.

Cadmium: Sticks and bars, $1.70 per lb deld.

Cobalt: 97-99%, $2.00 per lb for 550-lb keg; $2.02 per lb for 100 lb case; $2.07 per lb under 100 lb.

Columbium: Powder, $120 per lb, nom.

Copper: Electrolytic, 27.00 deld.; custom smelters, 25.50; lake, 27.00 deld.; fire refined, 26.75 deld.

Germanium: First reduction, $179.17-197.31 per lb; intristic grade, $197.31-220 per lb, depending on quantity.

Gold: U. S. Treasury, $35 per oz.

Indium: 99.9%, $2.25 per troy oz.

Iridium: $86-110 nom. per troy oz.

Lead: Common, 13.30; chemical, 13.40; corroding, 13.40, St. Louis. New York basis, add 0.20.

Lithium: 98 + %, 50-100 lb, cups or ingots $12; rod, $15; shot or wire, $16. 100-500 lb, cups or ingots, $10.50; rod, $14; shot or wire, $15, f.o.b. Minneapolis.

Magnesium: Pig, 35.25; ingot, 36.00 f.o.b. Velasco, Tex.; 12 in. sticks, 59.00 f.o.b. Madison, Ill.

Magnesium Alloys: AZ91A (diecasting), 40.75 deld.; AZ63A, AZ92A, AZ91C (sand casting), 40.75, f.o.b. Velasco, Tex.

Mercury: Open market, spot, New York, $230-233 per 76-lb flask.

Molybdenum: Unalloyed, turned extrusions, 3.75-5.75 in. round, $9.60 per lb in lots of 2500 lb or more, f.o.b. Detroit.

Nickel: Electrolytic cathodes, sheets (4 x 4 in. and larger), unpacked, 74.00; 10-lb pigs, unpacked, 78.25; "XX" nickel shot, 79.50; "F" nickel shot for addition to cast iron, 74.50; "F" nickel 5 lb ingots in kegs for addition to cast iron, 75.50. Prices f.o.b. Port Colborne, Ont., including import duty. New York basis, add 1.01. Nickel oxide sinter, 71.25 per lb of nickel content before 1 cent freight allowance, f.o.b. Copper Cliff, Ont.

Osmium: $80-100 per troy oz. nom.

Palladium: $21-24 per troy oz.

Platinum: $81-87 per troy oz from refineries.

Radium: $16-21.50 per mg radium content, depending on quantity.

Rhodium: $118-125 per troy oz.

Ruthenium: $45-55 per troy oz.

Selenium: $10.50 per lb, commercial grade.

Silver: Open market, 90.625 per troy oz.

Sodium: 16.50, c.l.; 17.00 l.c.l.

Tantalum: Rod, $60 per lb; sheet, $55 per lb.

Tellurium: $1.65-1.85 per lb.

Thallium: $12.50 per lb.

Tin: Straits, N. Y., spot and prompt, 91.00.

Titanium: Sponge, 99.3+%, grade A-1 ductile (0.3% Fe max.), $2.25; grade A-2 (0.5% Fe max.), $2.00 per lb.

Tungsten: Powder, 98.8%, carbon reduced, 1000-lb lots, $3.50 per lb nom., f.o.b. shipping point; less than 1000 lb, add 15.00; 99+% hydrogen reduced, $4.10-4.20.

Zinc: Prime Western, 10.00; brass special, 10.25; intermediate, 10.50, East St. Louis, freight allowed over 0.50 per lb. New York basis, add 0.50. High grade, 11.35; special high grade, 11.75 deld. Die casting alloy ingot No. 3, 14.25; No. 2, 15.25; No. 5, 14.75 deld.

Zirconium: Sponge, commercial grade, $5-10 per lb.

(Note: Chromium, manganese, and silicon metals are listed in ferroalloy section.)

SECONDARY METALS AND ALLOYS

Aluminum Ingot: Piston alloys, 23.75-30.25; No. 12 foundry alloy (No. 2 grade), 21.75-23.00; 5% silicon alloy, 0.60 Cu max., 25.50-26.00; 13 alloy, 0.60 Cu max., 25.50-26.00; 195 alloy, 24.75-26.75; 108 alloy, 22.25-23.00. Steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 23.75; grade 2, 22.00; grade 3, 20.75; grade 4, 19.00.

Brass Ingot: Red brass, No. 115, 26.75; tin bronze, No. 225, 36.00; No. 245, 30.25; high-leaded tin bronze, No. 305, 30.75; No. 1 yellow, No. 405, 22.00; manganese bronze, No. 421, 24.50.

Magnesium Alloy Ingot: AZ63A, 40.75; AZ91B, 37.25; AZ91C, 40.75; AZ92A, 40.75.

NONFERROUS PRODUCTS

BERYLLIUM COPPER

(Base prices per lb, plus mill extras, 2000 to 5000 lb; nom. 1.9% Be alloy.) Strip, $1.82, f.o.b. Temple, Pa., or Reading, Pa.; rod, bar, wire, $1.80, f.o.b. Temple, Pa.

COPPER WIRE

Bare, soft, f.o.b. eastern mills, 30,000-lb lots, 32.355; l.c.l., 32.98. Weatherproof, 30,000-lb lots, 33.66; l.c.l., 34.78. Magnet wire deld., 40.43, before quantity discounts.

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh.) Sheets, full rolls, 140 sq ft or more, $19.00 per cwt; pipe, full coils, $19.00 per cwt; traps and bends, list prices plus 30%.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill.) Sheets and strip, $9.50-15.95; sheared mill plate, $8.00-11.50; wire, $7.50-11.50; forging billets, $6.00-7.60; hot-rolled and forged bars, $6.15-7.90.

ZINC

(Prices per lb, c.l., f.o.b. mill.) Sheets, 24.00; ribbon zinc in coils, 20.50; plates 19.00.

ZIRCONIUM

Plate, $12.50-19.20; H.R. strip, $12.50-22.90; C.R., strip, $15.00-31.25; forged or H.R. bars, $11.00-17.40.

NICKEL, MONEL, INCONEL

	"A" Nickel	Monel	Inconel
Sheets, C.R.	126	106	128
Strip, C.R.	124	108	138
Plate, H.R.	120	105	121
Rod, Shapes, H.R.	107	89	109
Seamless Tubes	157	129	200

ALUMINUM

Sheets: 1100 and 3003 mill finish (30,000 lb base; freight allowed).

Thickness Range Inches	Flat Sheet	Coiled Sheet
0.249-0.136	43.10-47.60	.....
0.135-0.096	43.60-48.70	40.50-41.10
0.095-0.077	44.30-50.50	40.60-41.30
0.076-0.061	44.90-52.80	40.80-42.00
0.060-0.048	45.60-55.10	41.40-43.10
0.047-0.038	46.20-57.90	41.90-44.50
0.037-0.030	46.60-62.90	42.30-46.30
0.029-0.024	47.20-54.70	42.60-47.00
0.023-0.019	48.20-58.10	43.70-45.40
0.018-0.17	49.00-55.40	44.30-46.00
0.016-0.015	49.90-56.30	45.10-46.80
0.014	50.90	46.10-47.80
0.013-0.012	52.10	46.80
0.011	53.10	48.00
0.010-0.0095	54.60	49.40
0.009-0.0085	55.90	50.90
0.008-0.0075	57.50	52.10
0.007	59.00	53.60
0.006	60.60	55.00

ALUMINUM (continued)

Plates and Circles: Thickness 0.250-3 in., 24-60 in. width or diam., 72-240 in. lengths.

Alloy	Plate Base	Circle Base
1100-F, 3003-F	42.70	47.50
5050-F	43.80	48.60
3004-F	44.80	50.50
5052-F	45.40	51.20
6061-T6	46.90	53.00
2024-T4*	50.60	57.40
7075-T6*	58.40	66.00

*24-48 in. width or diam., 72-180 in. lengths.

Screw Machine Stock: 30,000 lb base.

Diam. (in.) or across flats	Round 2011-T3	Round 2017-T4	Hexagonal 2011-T3	Hexagonal 2017-T4
Drawn				
0.125	78.20	75.20	....	....
0.156-0.172	66.20	63.40	....	....
0.188	66.20	63.40	....	81.60
0.219-0.234	63.00	61.50	....	....
0.250-0.281	63.00	61.50	....	77.90
0.313	63.00	61.50	....	74.20
0.344	62.50	....	....	....
Cold-Finished				
0.375-0.547	62.50	61.30	74.80	69.80
0.563-0.688	62.50	61.30	71.10	65.50
0.719-1.000	61.00	59.70	64.90	61.70
1.063	61.00	59.70	....	59.60
1.125-1.500	58.60	57.40	62.80	59.60
Rolled				
1.563	57.00	55.70	....	....
1.625-2.000	56.30	54.90	....	57.50
2.125-2.500	54.80	53.40	....	....
2.563-3.375	53.20	51.70	....	....

Forging Stock: Round, Class 1, 45.20-58.60 in specific lengths, 36-144 in., diam. 0.375-8 in. Rectangles and squares, Class 1, 50.50-66.60 in random lengths, 0.375-4 in. thick, width 0.750-10 in.

Pipe: ASA schedule 40, alloy 6063-T6, standard lengths, plain ends, 90,000-lb base, per 100 ft.

Nom. Pipe Size (in.)		Nom. Pipe Size (in.)	
¾	$19.40	2	$ 59.90
1	30.50	4	165.05
1¼	41.30	6	296.10
1½	49.40	8	445.55

Extruded Solid Shapes:

Factor	Alloy 6063-T5	Alloy 6062-T6
9-11	45.40-47.00	60.60-64.80
12-14	45.70-47.20	61.30-65.80
15-17	45.90-47.90	62.50-67.50
18-20	46.50-48.30	64.50-70.10

MAGNESIUM

Sheet and Plate: AZ31B standard grade, 0.32 in., 103.10; .081 in., 77.90; .125 in., 70.40; .188 in., 69.00; .250-2.0 in., 67.90. AZ31B spec. grade, .032 in., 171.30; .081 in., 108.70; .125 in., 98.10; .188 in., 95.70; .250-2.00 in., 93.30. Thread plate, .188 in., 71.70; .250-2.00 in., 70.60. Tooling plates, .250-3.0 in., 73.00.

Extruded Solid Shapes:

Factor	Com. Grade (AZ31C)	Spec. Grade (AZ31B)
6-8	69.60-72.40	84.60-87.40
12-14	70.70-73.00	85.70-88.00
24-26	75.60-76.30	90.60-91.30
36-38	89.20-90.30	104.20-105.30

NONFERROUS SCRAP

DEALER'S BUYING PRICES

(Cents per pound, New York, in ton lots.)

Aluminum: 1100 clippings, 13.50-14.00; old sheets, 10.50-11.00; borings and turnings, 6.50-

BRASS MILL PRICES

	MILL PRODUCTS a				SCRAP ALLOWANCES f		
	Sheet, Strip, Plate	Rod	Wire	Seamless Tubes	Clean Heavy	Rod Ends	Clean Turnings
Copper	49.13b	46.36c	....	49.32	23.000	23.000	22.250
Yellow Brass	43.02	31.30d	43.56	45.93	17.375	17.125	15.750
Low Brass, 80%	45.50	45.44	46.04	48.31	19.500	19.250	18.750
Red Brass, 85%	46.37	46.31	46.91	49.18	20.250	20.000	19.500
Com. Bronze, 90%	47.78	47.72	48.32	50.34	21.000	20.750	20.000
Manganese Bronze	51.01	45.11	55.61	....	16.125	15.875	15.375
Muntz Metal	45.39	41.20	....	....	16.375	16.125	15.625
Naval Brass	47.27	41.58	54.33	50.68	16.125	15.875	15.375
Silicon Bronze	53.76	52.95	53.80	55.74e	22.625	22.375	21.625
Nickel Silver, 10%	59.43	61.75	61.75	....	23.625	23.375	11.813
Phos. Bronze, A-5%	68.07	68.57	68.57	69.75	23.750	23.500	22.500

a. Cents per lb, f.o.b. mill; freight allowed on 500 lb or more. b. Hot-rolled. c. Cold-drawn. d. Free cutting. e. 3% silicon. f. Prices in cents per lb for less than 20,000 lb, f.o.b. shipping point. On lots over 20,000 lb at one time, or any or all kinds of scrap, add 1 cent per lb.

7.00; crankcases, 10.50-11.00; industrial castings, 10.50-11.00.

Copper and Brass: No. 1 heavy copper and wire, 18.50-19.00; No. 2 heavy copper and wire, 15.50-16.00; light copper, 15.00-15.50; No. 1 composition red brass, 15.50-16.00; No. 1 composition turnings, 15.00-15.50; new brass clippings, 13.00-13.50; light brass, 9.00-9.50; heavy yellow brass, 11.00-11.50; new brass rod ends, 12.00-12.50; auto radiators, unsweated, 11.50-12.00; cocks and faucets, 12.50-13.00; brass pipe, 12.50-13.00.

Lead: Heavy, 8.50-9.00; battery plates, 4.00-4.25; linotype and stereotype, 10.50-11.00; electrotype, 9.50-10.00; mixed babbitt, 10.50-11.00.

Monel: Clippings, 33.00-34.00; old sheets, 31.00-32.00; turnings, 23.00-24.00; rods, 33.00-34.00.

Nickel: Sheets and clips, 50.00-55.00; rolled anodes, 50.00-55.00; turnings, 45.00-50.00; rod ends, 50.00-55.00.

Zinc: Old zinc, 3.00-3.25; new diecast scrap, 2.75-3.00; old diecast scrap, 1.50-1.75.

REFINERS' BUYING PRICES

(Cents per pound, carlots, delivered refinery)

Aluminum: 1100 clippings, 16.50-17.50; 3003 clippings, 16.50-17.50; 6151 clippings, 16.00-17.50; 5052 clippings, 16.00-17.00; 2014 clippings, 15.50-17.00; 2017 clippings, 15.50-17.00; 2024 clippings, 15.50-17.00; mixed clippings, 15.00-16.00; old sheets, 13.50; old cast, 13.50; clean old cable (free of steel), 16.00-16.50; borings and turnings, 13.50-15.00.

Beryllium Copper: Heavy scrap, 0.020-in. and heavier, not less than 1.5% Be, 53.00; light scrap, 48.00; turnings and borings, 33.00.

Copper and Brass: No. 1 heavy copper and wire, 21.25; No. 2 heavy copper and wire, 19.75; light copper, 17.50; refinery brass (60% copper) per dry copper content, 19.00.

INGOTMAKERS' BUYING PRICES

(Cents per pound, carlots, delivered)

Copper and Brass: No. 1 heavy copper and wire, 21.25; No. 2 heavy copper and wire, 19.75; light copper, 17.50; No. 1 composition borings, 18.50; No. 1 composition solids, 19.00; heavy yellow brass solids, 13.00; yellow brass turnings, 12.00; radiators, 15.00.

PLATING MATERIALS

(F.o.b. shipping point, freight allowed on quantities)

ANODES

Cadmium: Special or patented shapes, $1.70 per lb.

Copper: Flat-rolled, 45.29; oval, 43.50, 5000-10,000 lb; electrodeposited, 35.75, 2000-5000 lb lots; cast, 36.25, 5000-10,000 lb quantities.

Nickel: Depolarized, less than 100 lb, 114.25; 100-499 lb, 112.00; 500-4999 lb, 107.50; 5000-29,999 lb, 105.25; 30,000 lb, 103.00. Carbonized, deduct 3 cents a lb.

Tin: Bar or slab, less than 200 lb, 109.50; 200-499 lb, 108.00; 500-999 lb, 107.50; 1000 lb or more, 107.00.

Zinc: Balls, 17.50; flat tops, 17.50; flats, 19.25; ovals, 18.50, ton lots.

CHEMICALS

Cadmium Oxide: $1.70 per lb in 100-lb drums.

Chromic Acid: 100 lb, 33.30; 500 lb, 32.80; 2000 lb, 32.15; 5000 lb, 31.80; 10,000 lb, 31.30; f.o.b. Detroit.

Copper Cyanide: 100-200 lb, 71.60; 300-900 lb, 69.60.

Copper Sulphate: 100-1900 lb, 14.55; 2000-5900 lb, 12.55; 6000-11,900 lb, 12.30; 12,000-22,900 lb, 12.05; 23,000 lb or more, 11.55.

Nickel Chloride: Less than 400 lb, 35.00; 400-9990 lb, 33.00; 10,000 lb, 32.50.

Nickel Sulphate: 5000-22,000 lb, 33.50; 23,000-35,900 lb, 33.00; 36,000 lb or more, 32.50.

Sodium Cyanide: 100 lb, 27.60; 200 lb, 25.90; 400 lb, 22.90; 1000 lb, 21.90; f.o.b. Detroit.

Sodium Stannate: Less than 100 lb, 73.70; 100-600 lb, 64.80; 700-1900 lb, 62.00; 2000-9900 lb, 60.20; 10,000 lb or more, 58.90.

Stannous Chloride (anhydrous): Less than 25 lb, 162.90; 25 lb, 127.90; 100 lb, 112.90; 400 lb, 110.40; 5200-19,600 lb, 98.20; 20,000 lb or more, 86.00.

Stannous Sulphate: Less than 50 lb, 125.80; 50 lb, 95.80; 100-1900 lb, 93.80; 2000 lb or more, 91.80.

Zinc Cyanide: 100-200 lb, 59.00; 300-900 lb, 57.00.

(*Concluded from Page* 189)

tric furnaces are out of the market. Some indicate they may begin buying limited quantities this month.

A couple of ships are loading scrap for export on the Gulf Coast, but prices are reported to be the lowest in a long time.

Some dealers are pessimistic about any early pickup in quotations with district steel production still declining.

Seattle — The scrap market is marking time. Dealers estimate prices are down another $1, but quotations are nominal with representative sales lacking. Consumers are well stocked.

Oriental buyers are hard pressed financially, but Japanese stocks are low and exporters here anticipate some business from that area at the turn of the year.

Los Angeles—Scrap prices have nose-dived here, the market being down $4 a ton on the average. No. 1 heavy melting steel is off $5, now being quoted at $39. No. 2 heavy melting also is off $5 at $37. Machine shop turnings dropped $11, being quoted at $20.

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STEEL CASTING SALES ENGINEER
Challenging opportunity for experienced salesman. Practical foundry and technical background required. Location Northeast. Age range 35 to 45. Salary plus commission, plus expenses. Reply with complete resume to Box 592, STEEL, Penton Bldg., Cleveland 13, Ohio.

Positions Wanted

COLD STRIP man desires to locate with medium size mill as Ass't Superintendent or better. 24 years experience cold rolling steel and aluminum, the last 15 years in supervision as foreman and gen. foreman. Resume on request. Reply Box 612, STEEL, Penton Bldg., Cleveland 13, Ohio.

MECHANICAL ENGINEER, 43, graduate, 20 yrs. experience plant engineering, forward planning, design, specifications, new construction in seamless and welded tube mills and related plant facilities. Desires to relocate as dept. head or administrative assistant. Midwest or far west preferred. Appropriate responses acknowledged. Reply Box 602, STEEL, Penton Bldg., Cleveland 13, Ohio.

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National Galvanizing Company

Who will:

1. Do your galvanizing for you in the world's most modern and efficient galvanizing plant (which we would like you to consider your own private galvanizing department).

OR

2. Build and operate complete job galvanizing facilities in your city.

OR

3. Engineer and install modern, low-cost facilities to replace outmoded galvanizing operations.

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Galvanizing facilities to process 200 tons of job work per day

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Experienced, all grades of steel. Capable of assuming full responsibility. In reply enclose full resume giving experience, background, availability, age and salary requirement.

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NEW MOTORS AVAILABLE: Over 5,000 new motors, in stock, from ¼HP to 200 HP. Special low prices. Write, wire or phone collect!

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825-pound Pintle Bushing, for a hydroelectric power project

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NBD is geared for big stuff like this, or smaller parts, long-run . . . bushings, bearings, gear blanks, pump parts. We cast them in weights up to 20,000 lbs. Machined to any degree of finish, in diameters up to 72 inches. Precise tolerances held to your specifications.

NBD specializes in bronze metallurgy and casting techniques; has developed more than 40 special alloys. Completely equipped for shell mold, cast-to-size and centrifugal casting.

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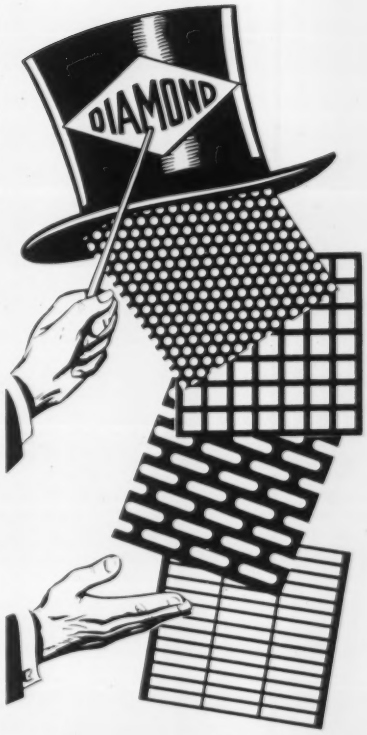

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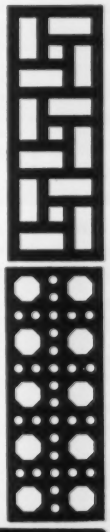

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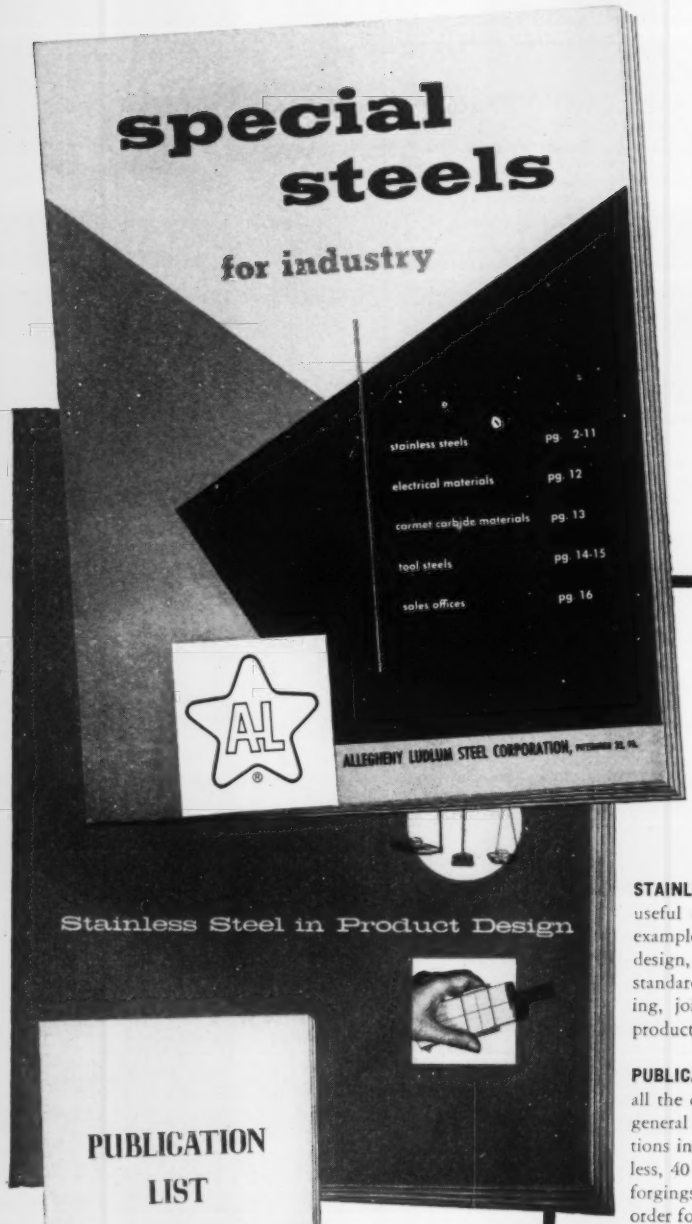
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A description of the literature that is available without charge, covering the selection, fabrication and application of stainless and heat-resistant steels, tool and die steels, electrical steels and alloys, and carbide materials of all necessary types.
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WSW 6784

ALLEGHENY LUDLUM

PIONEERING on the Horizons of Steel

Another large tonnage steel producer looks to single stack furnaces for better annealing

"Highly pleased," say operators of pilot installation of 6 Lee Wilson furnaces

The swing to Single Stack furnaces for big coil annealing is gathering momentum with each new order placed by leading steel producers.

A large Eastern mill was the latest to break a long standard multiple-stack precedent by purchasing a pilot installation of Lee Wilson Single Stack furnaces for purposes of comparative testing.

Early results indicate that the Single Stacks easily outproduce the older style furnaces per base and per man. What's more, the quality of the steel has never been better. "Highly pleased," say operators of the pilot installation.

If you don't already have the facts on this modern method of annealing, let Lee Wilson engineers put you in touch with those who have operated both types.

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SINGLE STACK RADIANT TUBE ANNEALING FURNACES
MAKE THE BEST METALS BETTER

■ ORIGINATORS AND LEADING PRODUCERS OF SINGLE STACK RADIANT TUBE FURNACES

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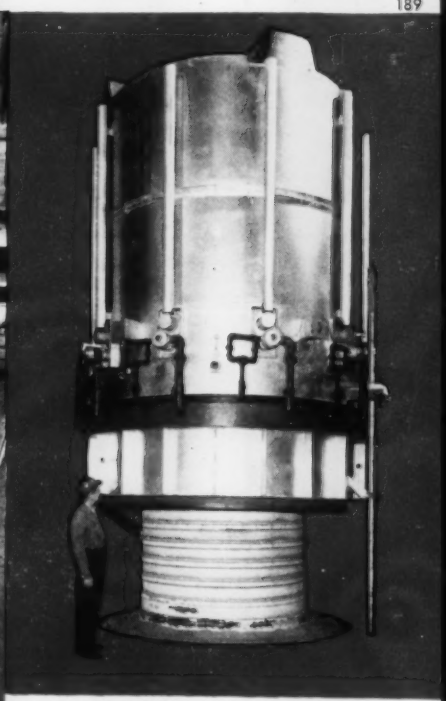
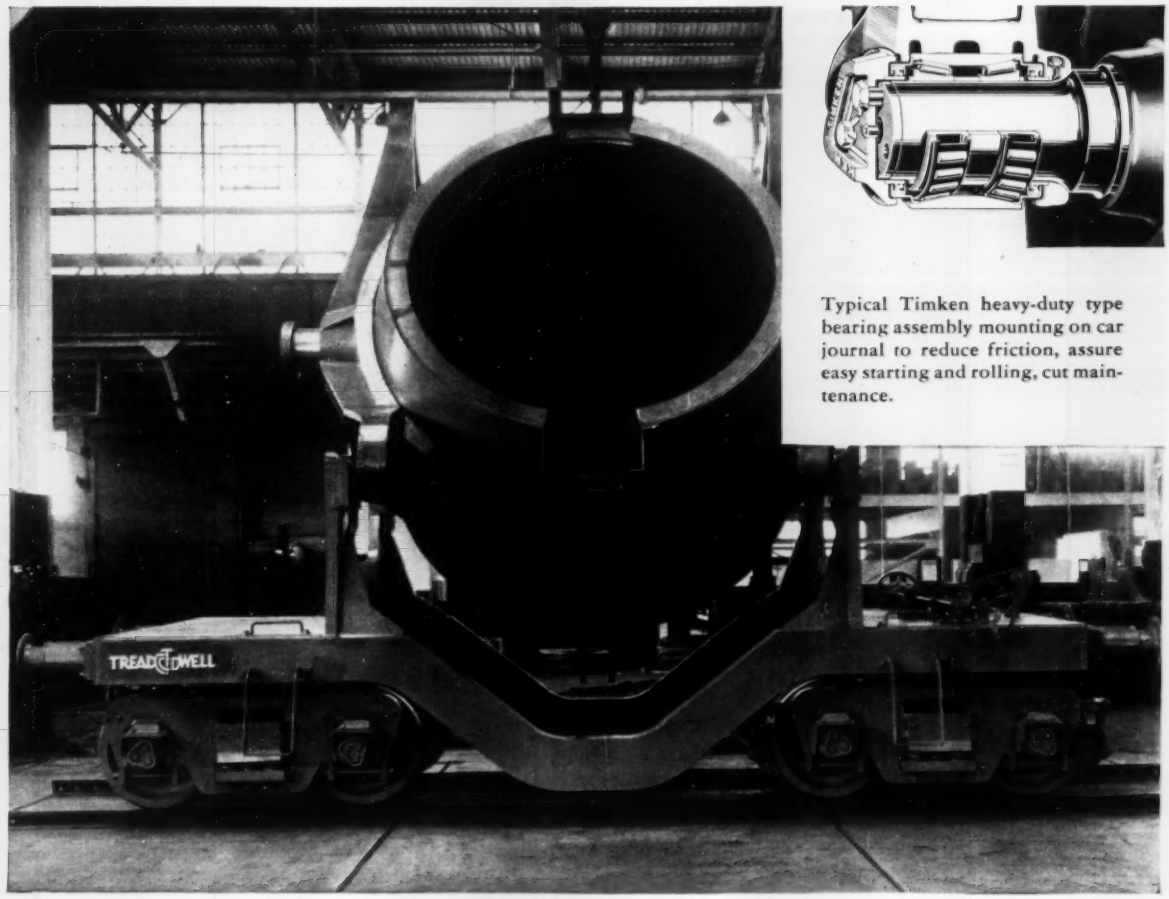


The photograph (left) shows a general view of the pilot installation consisting of 6 furnaces and 15 bases. Above is a close-up of one of the furnaces being lifted from a charge.



Typical Timken heavy-duty type bearing assembly mounting on car journal to reduce friction, assure easy starting and rolling, cut maintenance.

TIMKEN® bearings cut starting resistance 88% —help 75-ton ladle car roll easier, work longer

THIS 75 gross-ton-load ladle car must start, roll and keep rolling easily, and do it with safety, efficiency and minimum maintenance. Its fabricators, Treadwell Construction Company found a ready answer by mounting eight heavy-duty Timken® AP (All-Purpose) bearing assemblies on the axles.

Because they *roll* the load, Timken tapered roller bearings cut starting resistance up to 88 per cent. There's no metal-to-metal sliding friction. Loaded cars start easier and with less power loss.

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And Timken bearings cut lubricant costs because they're designed with seals to keep dirt and moisture *out*, lubricant *in*.

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